

VOLATILE PROFILE AND ESSENTIAL OIL COMPOSITION OF THREE SAMPLES OF *RHUS CORIARIA* L. SEEDS COLLECTED IN SICILY

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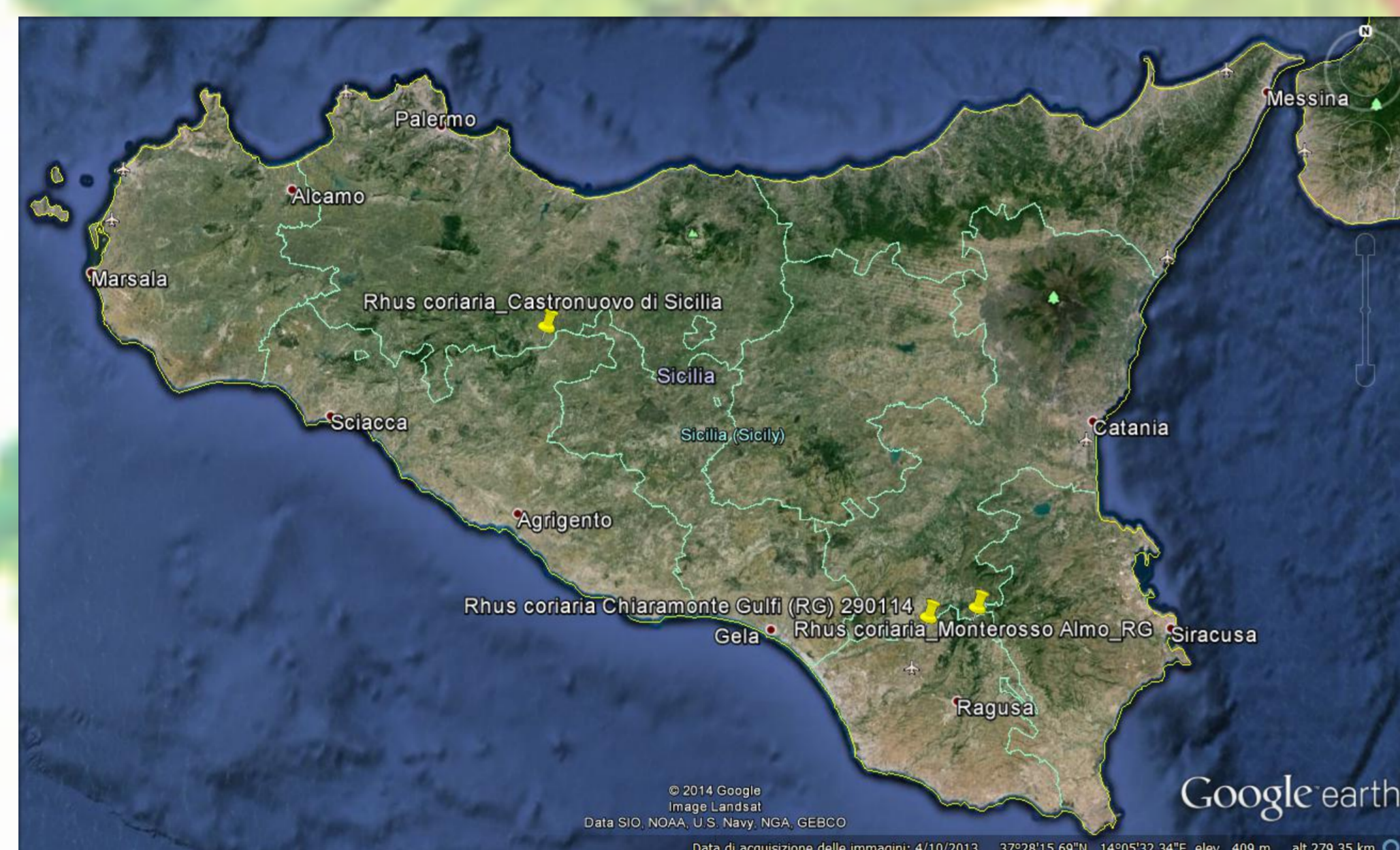
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INTRODUCTION

Rhus coriaria is a perennial medicinal and edible plant belonging to the Anacardiaceae family, commonly known as sumac (sommacco siciliano). It is characterized by spirally arranged leaves, spike flowers with red color and dense clusters of reddish drupes fruits. Native of Southern Europe species is widespread in the Mediterranean, North Africa and Middle East areas. Fruits of this tree are in the form of red or purple clusters. These berries vary in colour from brick red to dark purple, depending on where the shrub is grown and contain one seed. Berries are harvested just before they ripen, then left in the sun to dry. The dried fruits are used in cookery in some cuisine as a lemony taste to salads or meat. Prior to the introduction of lemons, the Romans used sumac as a souring agent. The Mediterranean diet is particularly rich in spices. Sumac is one example, which is widely used in Turkey, Greek and Jordan (1)

Rhus coriaria is largely used in the folk medicine as remedy for stomach disease, dermatitis and fever. Sumac is documented to possess antibacterial, antifungal, antioxidant, antiinflammatory, hepatoprotective, anti-ischemic, vasorelaxant, hypoglycemic, and non-mutagenic properties (2). From an industrial point of view, sumac contains colouring matter and tannins which are used in dyeing and tanning fine leather. Leaves are also exported for this purpose. Previous phytochemical studies of this plant reported that its leaves contained flavones, tannins, anthocyanins, and organic acids (malic, citric, pyruvic acids) (3). However, it is the fruit of the plant that is typically consumed as spice after drying and grinding. The fruits contain tannins, volatile oil, various organic acids (such as malic, citric, and pyruvic acids), anthocyanins and fixed oil. There are several studies in the literature on chemical composition of essential oil (4) and aldehydic components, along with terpenes and sesquiterpenes were found to characterize the typical aroma of sumac.

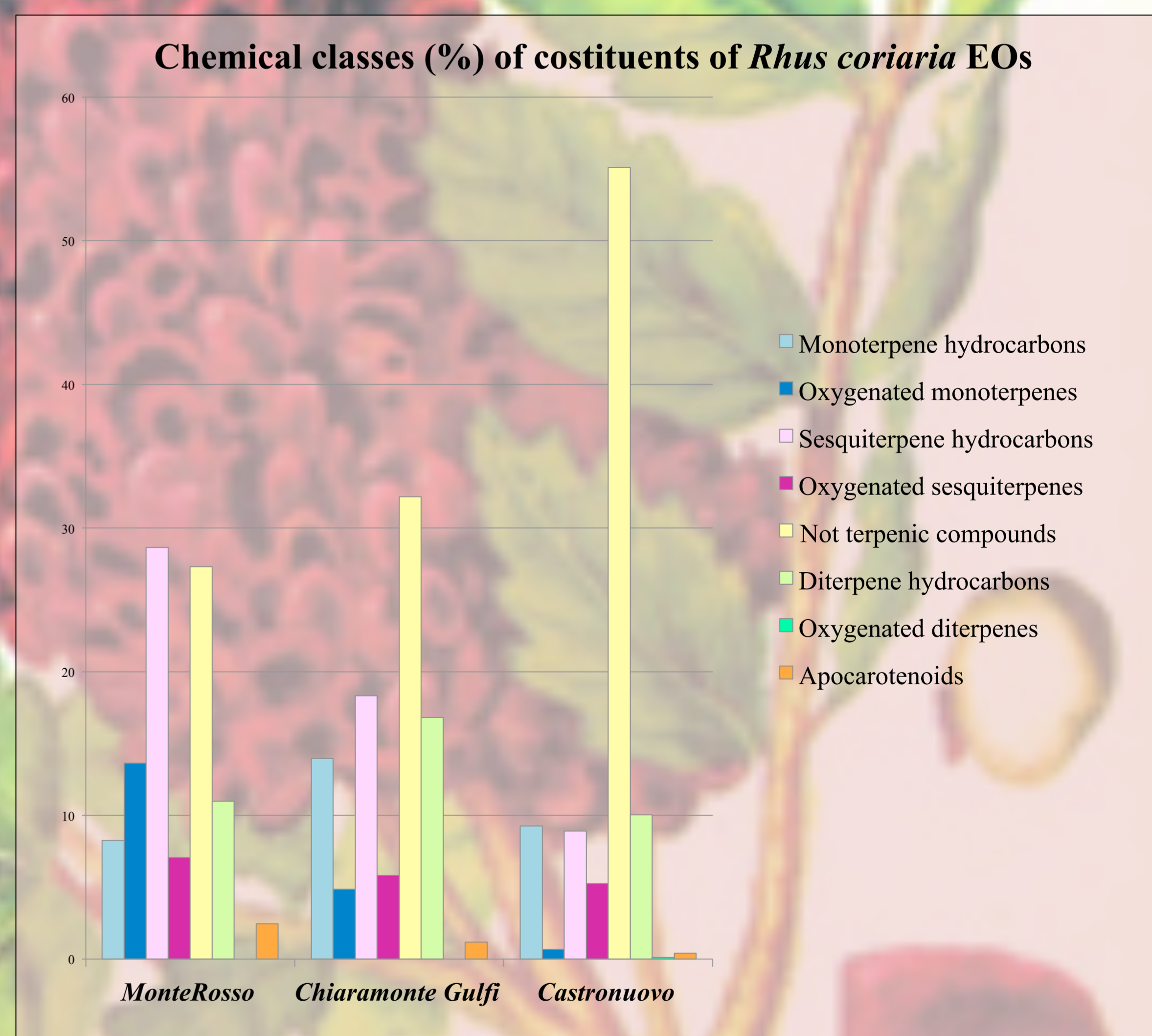


EXPERIMENTAL

The present study deals with the volatile composition of three fruit samples of *Rhus coriaria* collected in the wild in Sicily [Monterosso Almo (RG), Chiaramonte Gulfi (RG) e Castronuovo di Sicilia (PA)] in the same period (December 2013) and air dried. The hydrodistilled essential oils were analysed by GC-MS techniques. Qualitative and quantitative analysis of the essential oils were carried out by GC-MS analysis.

RESULTS AND DISCUSSION

Differences in the chemical class of constituents were evidenced in the three samples: the percentage of oxygenated monoterpenes is higher in plants collected in Monterosso (13.64%) than in the other two (Castronuovo, 4.87% and Chiaramonte, 0.66). Sesquiterpene hydrocarbons showed the same trend, ranging from 28.64% in Monterosso to 18.32% in Castronuovo and 8.9% of Chiaramonte. An opposite behaviour was found in the amount of non terpenic compounds. Among pure constituents cembrene was present in high percentage in Monterosso and Castronuovo samples (10.60% and 15.14%, respectively), while *p*-anisaldeide was the most abundant component in Chiaramonte sample (20.79%).



| Main compounds (%) of <i>Rhus coriaria</i> EOs from Sicily in comparison with literature data | | | | | | |
|---|-------------|----------------|-------------|-------|-------|------------------------|
| | Monte Rosso | Chiaramonte G. | Castronuovo | A§(5) | B§(5) | <i>R. Coriaria</i> (6) |
| Z-2-Heptenal | - | 7,76 | 9,66 | 1,86 | 2,49 | - |
| Limonene | 1,18 | 0,92 | 0,30 | 9,49 | - | 0,36 |
| <i>n</i> -Nonanal | 10,65 | 9,02 | 7,00 | 10,77 | 13,09 | 0,05 |
| <i>p</i> -Anisaldehyde | - | - | 20,79 | - | - | - |
| (Z)-2-Decenal | - | - | - | 9,90 | 42,35 | - |
| (E)-2-Decenal | - | 8,70 | 8,48 | - | - | 0,12 |
| Malic acid | - | - | - | - | - | 13,86 |
| β -Caryophyllene | 7,40 | - | - | 2,82 | 0,32 | 28,52 |
| δ -Cadinene | 5,30 | - | - | 0,67 | 0,39 | - |
| Cembrene | 10,60 | 15,14 | 9,32 | 6,35 | - | 4,96 |

§: two samples of *Rhus coriaria* grown in two different regions of Turkey (Artvin and Mersin, respectively) (5)

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