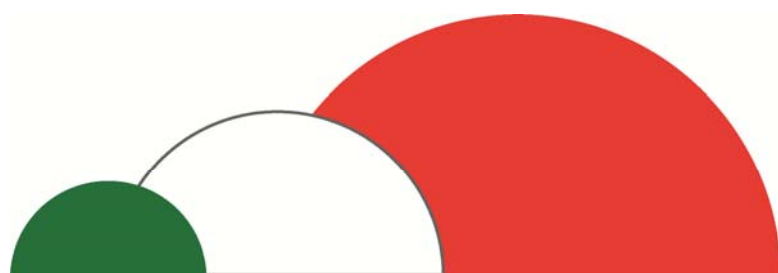


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# *Epitome*

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## **Geoitalia 2011**

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aspects of the landscapes, and to share the scientific heritage with the whole society. The goal is to provide a complete knowledge of an area (useful for environmental planning as well as for informative/educational programs and, last but not least, for new purposes of eco-touristic development) highlighting the richness of different landscapes. Wines, as well as other cultural expressions, are strictly linked to the territory: the popularization of the geo-environmental heritage walks on the same paths of tourism. A special attention should be devoted to an original link (already performed in some other countries) between landscapes, eno-tourism and sports: a new field for new actions, in order to promote a sustainable development in Italy, as well as a more sensible culture of responsible wine consumption. The modern technology offers new powerful tools: the GIS are able to synthesize, manage and represent a large amount of data; thanks to GIS it's almost easy to reach an evaluation of the state of the studied landscapes, referring to the dual risk/resource which characterizes our country. A further interesting opportunity is to discover, through this process, agricultural wine areas of special geological, environmental and cultural value, which in some cases can be considered geosites.

### F3-5 Orale Bollati, Andrea

10.1474/Epitome.04.0504.Geoitalia2011

#### VITICULTURE ZONATION AND GEOGRAPHICAL TRACEABILITY OF SUPERIOR QUALITY WINES THROUGH GEOCHEMICAL ANALYSIS: FIRST RESULTS FROM A CASE STUDY IN THE CESANESE WINE PRODUCTION ZONE (LATIUM, CENTRAL ITALY)

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*Key terms: Viticulture zonation; Cesanese wine; geographical traceability; isotopic analysis*

In this paper we present the first results of an on-going methodological research aiming at the definition of the capability of a territory to wine production, as well as the geographical traceability of typical wines (monocultivar). The main focus is to define an integrated geological-chemical methodology for the characterization of the product, the definition of links between wine composition (and its organoleptic characteristics) and the nature of its substratum, with the aim of valorization of autochthonous vines and the correspondent wines on the grounds of their original environment.

The study area includes two DOC and one DOCG areas, located in the Cesanese wine production zone, in the Frosinone and Rome provinces. The research is being conducted considering the geological, morphological, soil and climate characteristics in wine production aptitude. As for wine zonation, a GIS was used for the implementation of a data base and the realization of thematic layers (lithology, altitude, slope, exposition). First results show that in the study area outcrop mostly volcanic formations (33%) and sandstones (28%); vineyards are more widespread on soils deriving from volcanites and in a lesser percentage on sandy and alluvial soils.

The study vine sites are mostly located on SE, S and SW slopes, secondarily on W and E slopes, pending between 0 and 10%; additionally 92% of vineyard stands at altitudes ranging between 200 and 400 m a.s.l. Temperature, precipitation and humidity data of the study area have been compared to the references for vine-growing and show that the area is climatically suitable for wine production; moreover bio-climate indices are comprised in the typical range for the production of superior quality wine or high alcoholic grade.

In order to verify the geographical traceability of wines, the earth-alkaline metal strontium (Sr) has been considered, and specifically the <sup>87</sup>Sr/<sup>86</sup>Sr isotopic ratio, whose value depends on the Rb and Sr content of the substratum rock and on the time elapsed since its formation.

For the isotopic analysis we have selected red wines coming from diverse substratum, and from different wine-making farms, chosen on the grounds of wine quality, the reliability of wine provenance from well defined areas, on the mono variety of the cultivar and the wine making process. For each farm, one or more small area with "Cesanese comune" or "Cesanese di Affile" vines variety, on a homogeneous substratum, were selected; the latter is the most widespread in the study area and is one of the few varieties in Latium able to produce superior quality wines. For each vineyard we sampled the rock substratum, soil, grapes, must (with or without yeast) and wine.

First results show that the <sup>87</sup>Sr/<sup>86</sup>Sr isotopic ratio of the examined must and wines (also of different years) of each farm does not change and that a good correspondence exists between values of different wines and musts when vineyard are placed on soils originated from the same volcanic substratum. On the contrary, there is no correspondence between these values and those of wines and musts coming from farms whose vineyards are placed on substratum of different origin and age. In order to confirm these results samples of musts of 2010 and wine of 2009 are being analyzed, to confirm the repeatability of results in different climate and atmospheric conditions.

### F3-6 Orale Aldighieri, Barbara

10.1474/Epitome.04.0505.Geoitalia2011

#### WINEGIS: TERROIR OF ITALIAN WINES AND GEOGRAPHICAL INFORMATION SYSTEMS

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*Key terms: TERROIR; WINE; LANDSCAPE; WEBGIS; CARTOGRAPHY*

Wines and landscapes are deeply linked by a lot of geological elements (soils, rocks, morphological arrangement, climate and so on). This concept is well known, but not so shared as due. All the information about the complex themes about wine are usually summarized in the

French term Terroir, but in these last years new questions need new answers. An original model of web site about wine, GIS based, is able to show to the web surfers all the information about wine, landscapes and territory, following both of scientific and cultural way. One of the most important roles of Internet consists in providing an important source of information and knowledge to a potentially enormous public. Trade journals within the sector were indeed the first to offer blogs and forums on their sites. The vastness and dispersal of the information represents an obstacle to the accessing of this knowledge in particular in Italy. WineGIS, a modern geographic information system based on the internet, aims to make easier the access to information about wine and territory. Through the use of technologically advanced solutions, WineGIS offers, following an integrated approach, scientific and technical instruments able to represent in a unified way, a complex and rich view of Italian wine production areas.

GIS technologies, wide ranges of information, new ways of dialogues: these goals will become the tools for a modern development planning of the wine production areas.

WineGIS can contribute greatly to a richer understanding of the culture of Italian wines and aid to the appreciation of this important "fruit of our earth".

### F3-7 Orale Amadio, Vittorio

10.1474/Epitome.04.0506.Geoitalia2011

#### THE PRESERVATION OF THE VINEYARD LANDSCAPE AND THE GEO-ENVIRONMENTAL ANALYSIS

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*Key terms: Landscape; Ecosystem; Maps; Ecology; gis*

The Italian landscape is characterized by a lot of old rural landscapes and abandoned cultivation, particularly in some peri-urban natural areas in the south of Italy. The restoration of a degraded land, in some cases, can be made up performing the re-establishment of those areas traditionally devoted to vineyard cultivation. An integrated study of the territory by the GIS and the related thematic maps, such as Carta della Natura, may allow the identification of the interested areas and the planning for an effective environmental protection. The preservation of the rural historic landscape is a goal of primary importance for the nature and the culture of our country

### F3-8 Orale Aviani, Umberto

10.1474/Epitome.04.0507.Geoitalia2011

#### CHARACTERIZATION OF PROSECCO VINEYARDS (VENETO REGION, ITALY) USING SR-ISOTOPE DATA FOR THE GEOGRAPHICAL ORIGIN ASSIGNMENT

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*Key terms: food safety; stable isotopes; plant-soil interaction*

The realization of models of traceability that allow to go back to the origin of a product, protecting food safety, is an issue that has been affecting the wine production sector and the scientific community for a long time. This work aims at defining a reliable and repeatable operating protocol at a regional scale, that allows to confirm the geographic and varietal origin of grape and wine Prosecco CDO (QWPSR) in order to preserve their uniqueness and quality that underlie success recognized by all.

Analysis of stable isotope abundance ratios proved to be quite successful in determining the geographical origin of agricultural products; in particular, the Sr isotopic systematics is increasing applications to verify the authenticity of wines, since every isotopic fractionation occurring during the biological transfer from soil to plant and grapes is in-run corrected during mass-spectrometry data acquisition. The <sup>87</sup>Sr/<sup>86</sup>Sr ratio in grapes hence reflects the isotopic signature of soils from the different geological environment of growth and can also discriminate wines from different origins, provided that no changes occur during vinification.

In the viticultural areas of Controlled Denomination of Origin, of the provinces of Treviso, Padova, Vicenza, Belluno and Venezia, some zones characterized by homogeneous pedo-climatic environment have been identified: clayey soils and climatic variables comparable with the exception of rainfalls that show a positive gradient of 150 mm, by moving from south to north of the entire area selected.

In each of these areas more vineyards planted with Prosecco were selected, differing by type of conduction and pruning systems adopted, as Guyot, Sylvoz, spur pruned cordon, Geneva Double Curtain (GDC) and pergola, in order to check possible interference of these factors on the dynamics of absorption in addition to the role of soil composition.

To this aim, from each site a representative number of soil samples was collected, 3 depths for each site, interesting a total thickness of 60cm, corresponding to the soil layer more explored by roots; moreover, at the ripening, samples of grape consisting of a significant number of bunches have been taken.

The production activity, recorded over a significant number of vines, and in each vineyard, was assessed through the quantity of grapes per plant, number of bunches per vine and the average bunch weight; on obtained musts, conventional qualitative parameters such as, soluble solids content (° Brix), total titratable acidity and real acidity (pH) were evaluated. Successively, on wines obtained from every vineyard under investigation, the main aromatic precursors will be analyzed.

Samples of vineyard soil were dried in oven and the Sr isotope-ratio was measured on the exchangeable fraction of Sr, the carbonate fraction and by the total soil digestion. The Sr isotopic composition was also measured on crushed and homogenized grape skins, seeds and grape stalks and on carefully extracted grape juice by both nitric acid and hydrogen peroxide and oxidative calcination procedures, to highlight possible experimental bias. Sr was separated from the chemical matrix by ion-exchange and the isotopic composition determined by TIMS. The results indicate Sr-isotopic equilibrium between grape stalk, seeds and juice, supporting the hypothesis that the isotopic signature is not altered during biochemical reactions in the plant. A slightly lower isotopic composition is observed for grape skin, possibly reflecting the effects of an aerosol component.

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