



Research Note

Geology and wines of Pachino – Portopalo area. Preliminary outlines

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Abstract. This research, still in a developmental phase, analyses geological peculiarities and the relationships between them and the vineyards typical to the Pachino-Portopalo area.

The actual knowledge does not yet allow the drawing of tourist routes from which a geo-tourist would be able to join together Geosites and Oenosites. This will be one of the main topics of future research, oriented to produce substantial contributions to the sustainable development of this area.

Keywords: Geological Heritage, Geosites, Oenological Heritage, Oenogeological zonation, Oenogeological itineraries, Sustainable Development

1 Introduction

The southeastern extreme side of Sicily is characterised by the coexistence of many peculiarities that are very interesting, including geological landscape, historical-cultural aspects and eno-gastronomic features.

The authors of this paper have gained experience in the fields of history and geological evolution of this area of Sicily, particularly in the unique relationships between the geological substratum, the chemical and granulometric nature of its soils, and the unique mark that these soils attribute to the vine.

This preliminary contribution aims to establish a geological-oenological zonation of the Pachino-Portopalo area to draw geo-tourist routes for the joining of Geological resources with the oenological heritage.

2 Geological – Structural Frame

The basic volcanic rocks (Fig. 1: **CV**), outcropping between the cliff in the east of Portopalo and the area northwest of Pachino (Carveni, Romano, Capodicasa & Tricomi, 1991; Carveni & Capodicasa, 2011), are the oldest local rocks. The Cretaceous age has been inferred due to the fact they are comprised of a “Globotruncana calcilitites” layer and a “Rudiste limestones” layer of Maastrichtian age at the top (Fig. 1: **Cca**). An erosional surface, that truncates volcanic sequence, separates these units.

Limestones with Nummulites (Fig. 1: **Eca**), of Lutetian age, are characterised by a clear unconformity and rest on Cretaceous units. Clayey marls, with a breccias layer at the base, lie unconformably on older units and outcrop extensively in the north and west of Pachino. The age of these deposits are Messinian (Fig. 1: **Mm**). Moreover, there are calcareous marls in transgression on some of the older units. These are the classical “Trubi” (Fig. 1: **Pm**), of Infrapliocenic age, in heteropy with a calcarenitic facies. Finally, there are reddish calcarenites, of Thirrenian age, rich in organogenic component (Fig. 1: **Qca**).

Late and actual alluvial deposits outcrop at the borders of rivers (Fig. 1: **a**), and active dunes and fossil dunes are irregularly present along the coast (Fig. 1: **s**).

3 Geomorphological Frame

The morphological formations are a “consequence” of long and complicated palaeogeographic evolution; the more interesting structures are a product of the effusive processes of the Cretaceous age and the erosive action of the sea. Superficial eruptive structures, lined up

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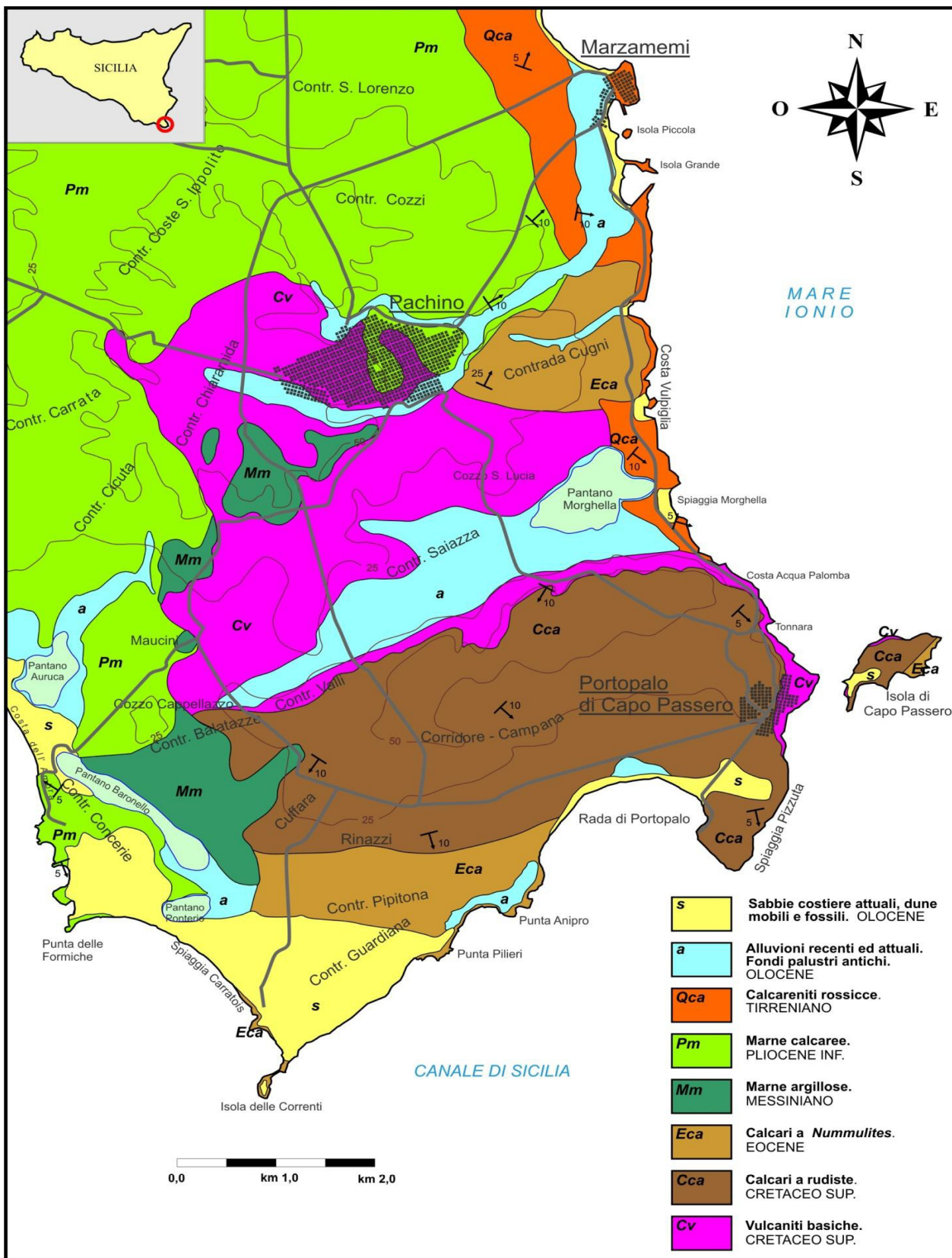


Figure 1: Schematic geological map (Carveni & Capodicasa, 2011).

along directrices of tectonic weakness, and many dykes with similar orientation, belong to effusive processes. Slopes, flat spaces of sea abrasion, marine terraces, marine caves, pot holes and coastal ponds are related to the erosive action of the sea.

Even karst forms, epygeal and hypogeal, are present.

The rise in sea level during the historical periods is shown by the presence of archaeological sites and historic installations, now partially or totally submerged.

The morphological characteristics may not be related to a unique pattern of evolution due to lithological variability of the outcropping rocks and their different exposure to the atmospheric elements during the geological time frame.

The northern sector, dominated by marly rocks, is marked by a series of little hilly raisings with rounded outlines, separated by large valleys. The erosional processes shown are extremely contained.

In the central sector, where outcrops are widely volcanic rocks, there are some volcanic deeply eroded structures. As a whole, the area is a wide valley that, in its terminal part, enlarges to form the coastal salt-marsh of Marghella. The hydrographic net is represented by short torrents.

The southern sector is characterised by typical tabular morphology of calcareous landscapes. A large plateau, delimited at the north and east by fault, descends gradually and gently towards south.

The littoral area is characterised by low and rocky coasts, from high cliffs on the sea and creeks, sometimes very narrow and deeply incised, large and occupied by sandy deposits.

The coastal inland is bordered by ponds: they are hollows divided from the sea by sandy borders and/or calcarenitic bars.

4 Vineyards and Substrata

The vineyard that is more diffusely cultivated to produce wine grapes, more than Frappato and Pignatello, is the Nero d'Avola. More recently, the Moscato Bianco has also been introduced.

The substrata of the soils are prevalingly constituted by Cretaceous volcanic rocks and Messinian marly-clayey sediments.

Studies and analyses to map out Geosites, Geomorphosites, Oenosites and itineraries conjugating Geological and Oenological Heritages are in progress. These surveys are very important for the sustainable development of such areas (Aquino, D'Orefice, Esposito, Valletta & Vitale, 2011; Sibi & Valletta, 2013).

The climate is Mediterranean arid, with long periods which are almost totally dry (from May to October). The arid climate can be sporadically interrupted by storms, precipitation and months with a temperate

climate, characterised by alternating short rainy periods with long periods of insolation.

5 Conclusions

This study concerns an area whose geological, structural and geomorphological features are well known. At this stage of the study we have taken a particular interest in the Oenological Heritage, especially the type of vineyards and the connection between substrata and soils. This study is only preliminary research for the most significant Geo-Oenological routes.

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References

- Aquino, S., D'Orefice, M., Esposito, L., Valletta, M. & Vitale, V. (2011). Geositi ed Enositi: itinerari tra il Patrimonio Geologico ed il Patrimonio Enologico dell'Irpinia. Una proposta preliminare. In *Atti del quinto congresso internazionale i paesaggi del vino – cartografia e paesaggi* (pp. 31–38). Trevi, Perugia.
- Carveni, P. & Capodicasa, A. (2011). Studio delle caratteristiche geologico-geomorfologiche della zona di Portopalo di Capo Passero (Sicilia sud-orientale) per la sua valorizzazione a scopo turistico. In *Associazione italiana geologia e turismo, atti del quarto congresso nazionale* (pp. 158–161). Bologna.
- Carveni, P., Romano, R., Capodicasa, A. & Tricomi, S. (1991). Geologia dell'area vulcanica di Capo Passero (Sicilia sud-orientale). *Mem. Soc. Geol. It.* 47, 431–447.
- Sibi, P. & Valletta, M. (2013). Geositi ed Enositi: itinerari attraverso il Patrimonio Geologico ed Enologico dell'Irpinia. Spunti di riflessione. In *Seminario intorno a "geologia e vini"*. Bolognano.