

# The Euganean Hills



Comenius project  
Biodiversity, Languages and Organic growing  
Padua 02/05/2011 -07/05/2011  
2° meeting

# Geology

The Euganean Hills share the history of a tropical ancient sea, that covered the area about 150 million years ago, together with Berici foothills and pre-alpine slopes of the Alps.

The layers of sediments went through physical and chemical changes during lithification and compaction. This process, called diagenesis, produced some sedimentary rocks.



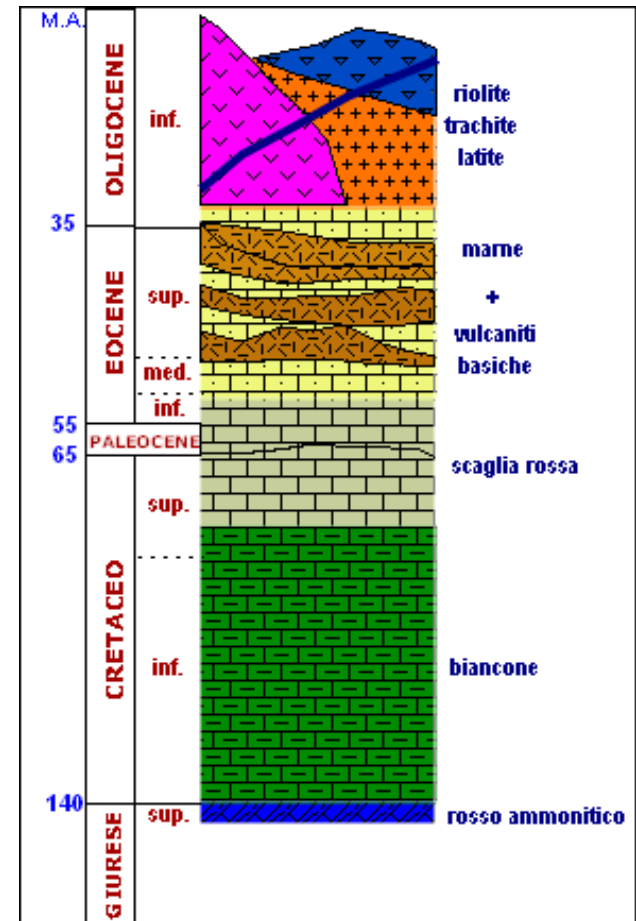
# Sedimentary Rocks in the Euganean Hills

**Red ammonite**, a limestone dating back about 130 million years ago that takes its name from the ammonites, extinct sea molluscs with a spiral shell.

**Biancone** is a clear fine-grained limestone (from 130 million to 90 million years ago).

**Scaglia Rossa**, (from 90 to 55 million years ago), an argillaceous thickly layered pinkish limestone, and in this layer have been found sea urchins and shark teeth.

**Marna Euganea** (30 million years ago), a clay-rich material. The marl is very brittle, tender, stratified, and mostly gray.



Stratigraphy of the Euganean Hills





*Red Ammonite*



*Biancone*



*Scaglia Rossa with fossil hurchin*



*Marna Euganea*

# Volcanism first phase

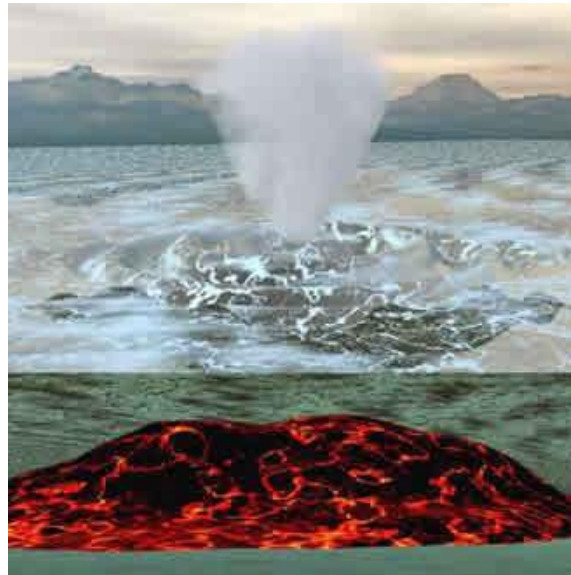
Volcanism is clearly divided into two distinct phases.

The first activity dates back to 43 million years ago.

Submarine **basaltic lava** eruptions, very smooth and rich in gas and vapour, poured and expanded unto the bottom plate of the ancient sea, forming low and fast solidifying accumulations upon contact with the water. A large amounts of exploded products, such as ashes and lapilli, formed thick layers of tuff among the mud of the seabed.



Tuff



Basalt



# Volcanism second phase

It was only the second volcanic phase that gave its final shape to the present region.

After a period of quiet, the early Oligocene (about 35 million years ago) saw a strong resumption of volcanic activity.

Acidic and very viscous lava materials, rich in silica and of very different composition than those of the first phase, flowed abundantly to create a unique area in the Venice region. From the cooling, arose rocks like **trachyte**, **rhyolite**, and **latite**, and **strands of basalt**. The strong push of magmas lifted and fractured in various ways the ancient layers of the seabed that until then had kept its original shape.



*Trachite*



*Riolite*

# Effusive rocks



**Trachite:** 33-35 million years ago, of grey color. It contains less  $\text{SiO}_2$  than rhyolite and constitutes the hills: Gemola, Cero, Rusta, Madonna, Grande, Rocca Pendice.

**Riolite:** slightly different from the Trachite, it is also extensively used in the extractive activity. It constitutes the tallest part of the hills: Venda, Vendevolo, Ricco, Cinto.

**Latite:** less diffused and less exploited, it contains less  $\text{SiO}_2$  than the other ones.

# Lava eruptions modelled Euganean Hills

The gently rolling and rounded hills, called Laccoliths, consist of a swelling of lava which cooled underneath a roof of older sedimentary rocks.

Sometimes the lava broke the sedimentary roof like in the case of Monte Lozzo.

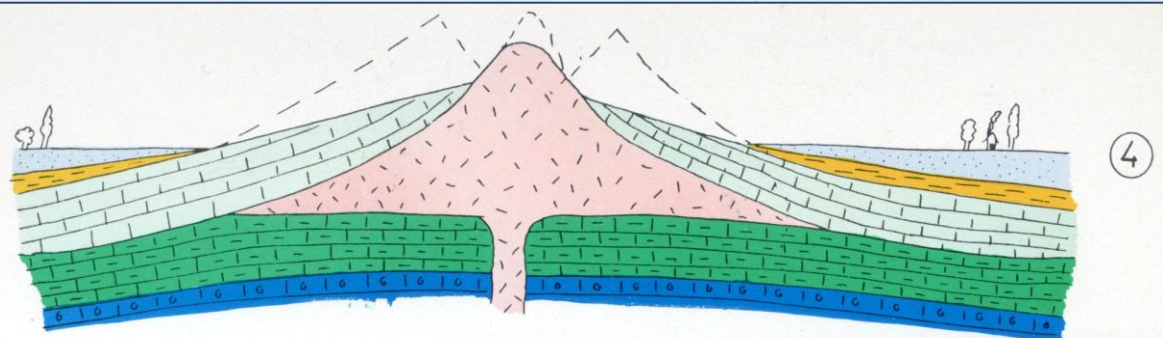
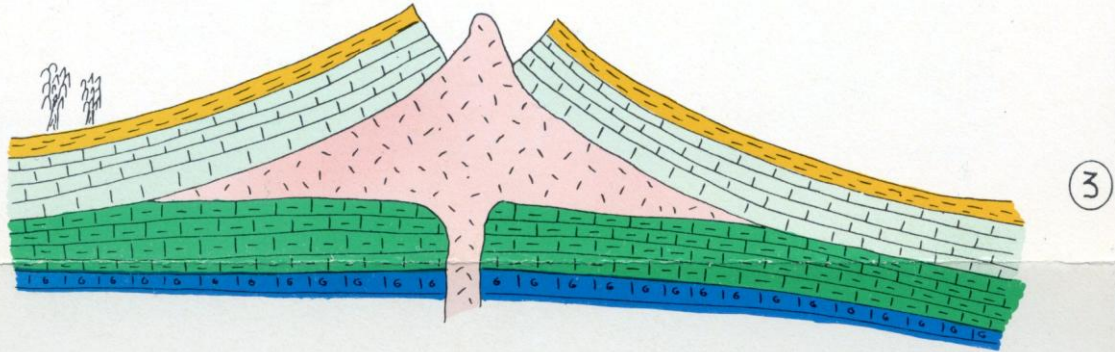
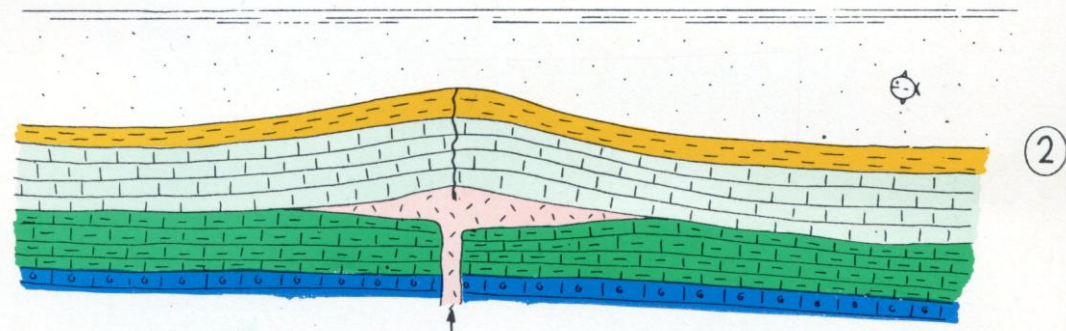
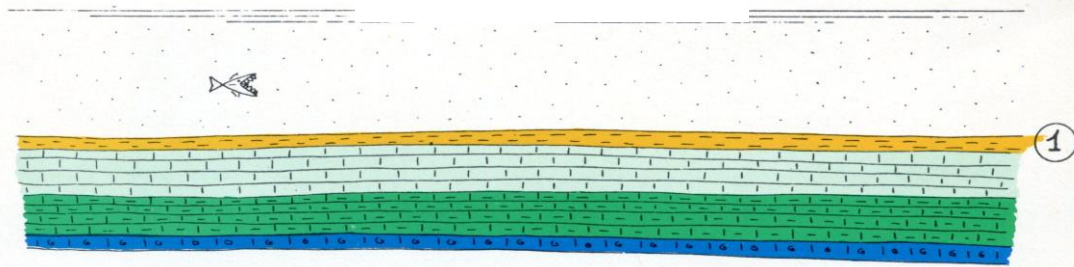
At the end of the volcanic period, the highest peaks probably emerged like an archipelago of steeply rocky islets in the ancient Padano Sea.

Much later, the emergence from the sea and the selective erosion of a million years, created a more varied landscape.

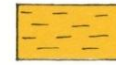
Now the softer sedimentary cover has been eroded by the atmospheric elements.



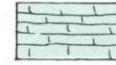
# EUGANEAN HILLS Monte Lozzo



## Sea sedimentary rocks



MARNE EUGANEE



SCAGLIA ROSSA



BIANCONE



ROSSO AMMONITICO

## Quaternary deposits



ALLUVIONI ATTUALI E RECENTI

## Volcanic rocks

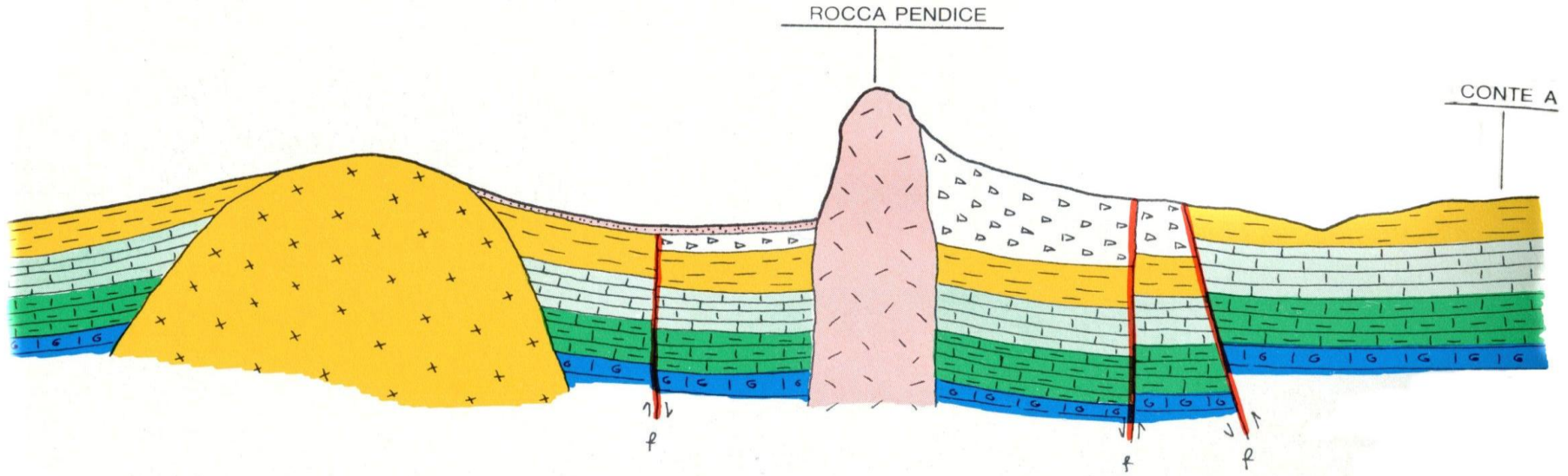
LAVE TRACHITICHE



Lava pushed the roof of older sedimentary rocks (2).  
Then broke them (3)  
The sedimentary cover has been eroded by atmospheric elements (4)

# EUGANEAN HILLS

# ROCCA PENDICE



## Quaternary deposits

## Sedimentary rocks

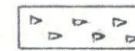
## Volcanic rocks



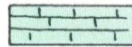
DETRITO



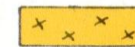
MARNE EUGANEE



TUFI E VULCANITI  
BASALTICHE



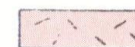
SCAGLIA ROSSA



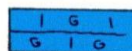
LAVE RIOLITICHE



BIANCONE



LAVE TRACHITICHE



ROSSO AMMONITICO

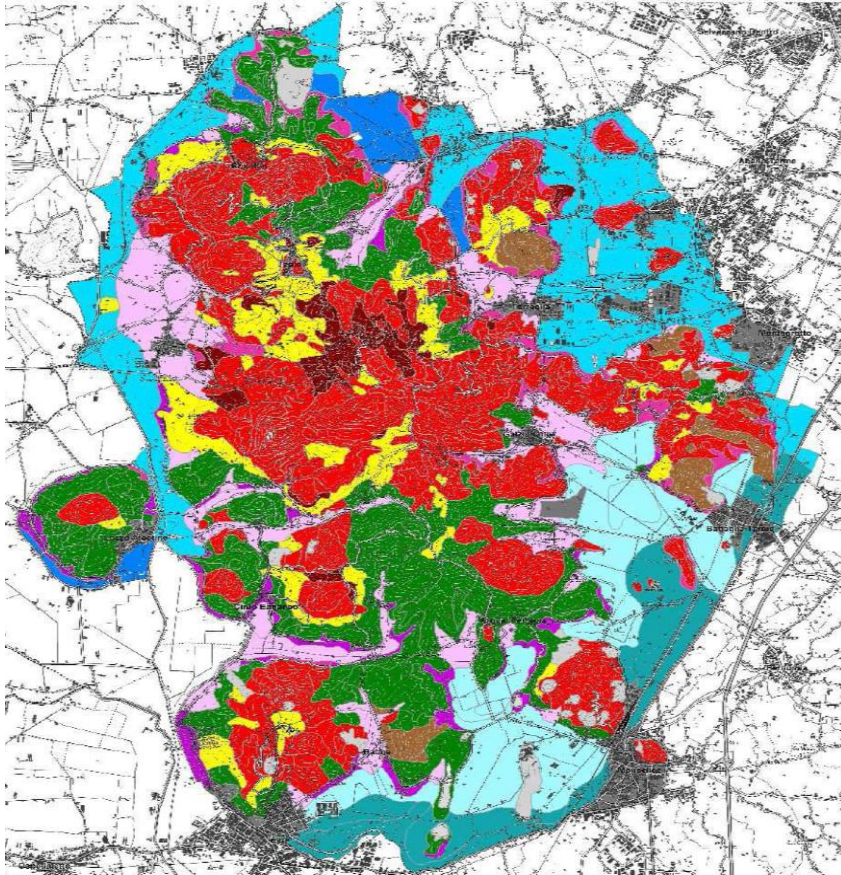
FAGLIA



**A section of the Euganean Hills with different types of rocks**



# Different types of soils



*Soils on acid rocks*



*Soils on basic rocks*



*Soils with intermediate characters*



*Limestone Soils*



*Soils with Marna Rocks*



*Soils with Mountainside detritus*



*Soils on floods of hilly rivers*



*Soils on flood plain of Brenta-Bacchiglione*



*Soils on flood plain of Adige*



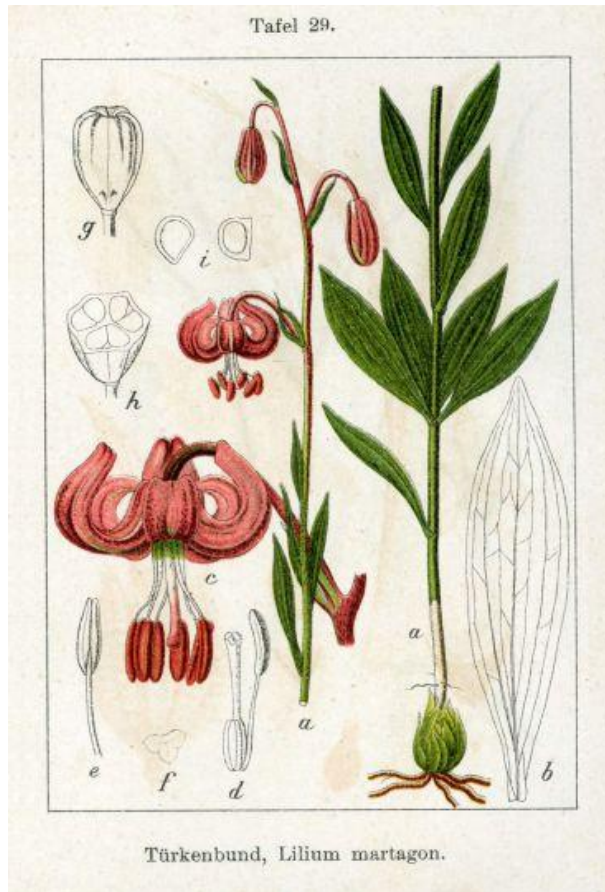
# Causes of biodiversity of the Euganean hills

The diversity of rocks evolved in different soils which can host a great varieties of plants.

During the ice ages the Euganean Hills, because of their south-position and the modest height, didn't have permanent glaciers and so they could act as a shelter for numerous mountain alpine species, that migrated towards south to escape the coming of ice in the Alps.

Some of them remained as **glacial relicts**.

They are: the red lily (*Lilium bulbiferum*), the martagon lily (*Lilium martagon*), the white birch (*Betula pendula*), the beech (*Fagus sylvatica*), the Epimedium alpinum, the Sempervivum arachnoideum and the blackberry (*Vaccinium myrtillus*).



During the postglacial period the climate was marked by a progressive increase of temperatures.

Between 5.000 and 3.000 years ago the European climate was hotter and less humid than the present one. This warm-arid climate allowed the settlements in northern Italy of a lot of species coming from the Mediterranean area.

In the last 3000 years a climatic worsening eliminated these species in the north of Italy, except in the small warmer oasis where they have been resisting until now. In particular in the Euganean Hills there are microclimatic conditions, that are very warm and dry in some of the south sides, and this allows some Mediterranean species to be present like **xerothermic relicts**. They are: the holm-oak (*Quercus ilex*), the turpentine tree (*Pistacia terebinthus*), the cistus (*Cistus savifolius*), strawberry-tree (*Arbutus unedo*), the heather (*Erica arborea*).



The climate of the Euganean Hills is characterized by an annual average temperature about 13° C and by a modest rain (700-900 mm average every year).

In the Euganean area, because of the short height and the conical form of the relief, the most important elements determining the temperatures on the versants are the position and the slope of the sides.

There are two main climate types:  
The submediterranean and the submountain.

Submediterranean climate concerns the sides facing south and the south zone of the Euganean Hills that is the most populated and cultivated (vine, olive, cherry tree, almond tree).





# Typical woods



*Erythronium dens-canis*

## CHESTNUT FOREST

Extensive on the northern sides with fresh climate is developed on the volcanic siliceous moist soils. The forest floor vegetation include snowdrop, houndstooth, daffodil, blackberry, and the rare martagone lily.



## OAK TERMOPHILUS WOOD

This wood occupies sunny dry slopes with shallow, poor and degraded soil, mostly on calcareous rocks. The downy oak is dominant and the companions are manna ash, Judas tree and maple. The undergrowth companions include the *Ruscus aculeatus*, hawthorn, and juniper.



*Quercus pubescens*



*Ruscus aculeatus*

# Mediterranean shrubland

This association has a scattered distribution. It's formed by an intricate vegetation of low-stemmed plants, evergreens in general, including holm oak, *Asparagus acutifolius*, *Cistus salvifolius* and violets; it develops on isolated, arid, and rocky volcanic soils facing southward.

In this community we can find dwarf Indian fig trees ("*Opuntia compressa*").

*Cistus salvifolius*



*Capparis spinosa*



*Opuntia compressa*



# ACACIA WOODS

Originally from North America, the acacia was imported at the start of the 1600's as an ornamental species, but excessive spread of forests and the abandonment of cultivation has given the plant a chance to diffuse at the expense of young chestnut and oak trees.

Acacia undergrowth is rather monotonous with few species including the elder and white and purple anemones





# MEADOWS

Locally named “**vegri**” , typically arid and sometimes devoid of soil, result from abandoned arable land and pastures. Their appearance is in continuous evolution and tends to the restoration of the original woodland;

In these areas xerophilous herbaceous species, like *Bromus erectus* and *Artemisia* dominate and **Ruta patavina** ( *Haplophyllum patavinum*) grows, the most important endemic botanical species of the Euganean Hills.



*Ruta patavina*



*Ophrys benacensis*

Orchids of bizarre form occasionally appear.



*Ophrys insectifera*

## Sources:

Rizzieri Masin- Corrado Tietto Flora dei Colli Euganei – Parco Regionale dei Colli Euganei

Libro rosso dei Colli Euganei – Parco regionale dei Colli Euganei

[http://www.parcocolleuganei.com/progetti/progetto\\_boschi/testo/percorso6.htm](http://www.parcocolleuganei.com/progetti/progetto_boschi/testo/percorso6.htm)

Life-Nature Project 2003: The Safeguard of the Habitats of ecologic interest on the Euganean Hills

Paolo Palucci- Stefano Rasi Caldogno Le orchidee spontanee dei Colli Euganei- Ente parco dei Colli Euganei.

[www.-disat.-unimib.-it/-palinologia/-pubblARTICOLI.-htm](http://www.-disat.-unimib.-it/-palinologia/-pubblARTICOLI.-htm)

La geologia dei Colli Euganei, il libro di Giamberto Astolfi, Franco Colombara ed. Canova

Authors : Students of 3 A and 3 C – Istituto professionale agrario San Benedetto da Norcia - Padova