

Geology of System 6

Puez–Odle

Traces of an island in the archipelago surrounded by deep sea

In the Parco Naturale Puez–Odle it is possible to trace, with a few exceptions, the entire stratigraphic sequence of the Dolomites from the Permian to the Cretaceous periods, about 200 million years of history, in a good state of preservation with little deformation.

In the northern part there is a predominance of aligned massifs of Dolomite rock, Sas de Putia and Sas Rigais, while the southern part, Gardenaccia, features karst plateaux with strange conical ridges, as on Col de la Soné. Near the Passo delle Erbe and in Valle di Sant’Anna there are outcrops of rock that tell of the arrival of the first Dolomite Sea, starting from the Permian desert plains. This exceptional area also features rocks that were witness to the mass extinction that occurred between the Permian and Triassic period, while the Anisian rocks show clear signs of the recovery made by the constructor organisms after the disastrous extinction. The rocks of the deep sea of the Anisian and Ladinian periods in Seceda are of major scientific interest in that the abundance of fossils makes extremely precise timescale measurements possible.

What is so special about this area is that it is uniquely able to relate the evolution of the period in which atolls and tropical reefs were the dominant features. The islands are presented in sequence, their original shape intact and perfectly recognizable. The geometric relationships between the islands built from organisms (carbonate structures) and deep-sea deposits surrounding them (basin) are also preserved intact. This complexity creates dramatic variations in the landscape, from the even slopes of mount Rasciesa, formed from the volcanic porphyry rock of the Permian Atesino chain, to the contrasting jagged rocks of the carbonate platform consisting of islands built from organisms, of Odle (Sciliar Dolomite), Puez–Gardenaccia or Sas de Putia (Cassian Dolomite). At the base of these vertical Dolomite walls deposits have been found resulting from the deep-sea sedimentation that is the foundation for the gently undulating formations found in Livinallongo, La Valle and San Cassiano. Finally, worthy of note are the Gardenaccia high plateaux on which can be found hummocks of soft dark rock full of ammonites of all sorts of unusual

shapes that are among the youngest in the Dolomites, from the Cretaceous period.

These places provide some wonderful panoramic views that display the paleo-geographic distribution of a part of the Triassic Dolomite archipelago preserved in today's landscape. From the Puez Odle island it is possible to see the Gardena and Sella Passes that were once stretches of sea, and Sassolungo and Monte Sella, once Triassic islands.

Geomorphology

This system is formed from two broad plateaux, Gardenaccia and Puez, surrounded by some of the most emblematic crests and peaks in the whole of the Dolomites, such as Sassongher, Sass di Putia and Sass Rigais, standing in stark contrast to the gently undulating surrounding landscape. The geomorphological set-up is a faithful reflection of the architecture of a Ladinian-Carnian fossil atoll, uncovered by erosion which has carved deep into the softer basinal rocks that covered its sides.

A splendid example of small-scale morpho-selection linked to lithological variation is the Col de La Sonè "pyramid", all that remains of the soft multi-coloured Puez marl formation that originally covered the whole of the rugged Gardenaccia plateau which is made of harder calcareous and Dolomite rocks. A sub-vertical fault system running in a NE-SW direction sets the orientation of the main valleys, Val Longia and Val di Funes, that cut across the system. The regularly shaped grid of tectonic lines running NE-SW and NW-SE across the massif also determines the alignment of the main walls bounding the Gardenaccia and Puez plateaux and creates the geometry of the prism-shaped towers and pinnacles of Sass de Putia and the Sass Rigais. The only morphologies relating to glaciation are the hanging cirque valleys of Val de la Roa, Val Chedul, Val di Lietres and Valle Stella Alpina, with late glacial-age moraine deposits and their associated ponds, the most significant of these being in Val di Funes and near Longiarù.

The phenomena associated with freezing-thawing processes are clear to see. Extensive debris and regularly-shaped cones and layers cloak the foot of all the main walls, subsequently becoming sources of debris flows. There are frequent landslides from the vertical walls, usually of moderate size, such as the Cir-Piz Sompluf landslide of 2006, while more extensive and slower-moving landslides occur where the rocks are mainly basinal clays, such as in Seceda. A prime example is the complex landslide that occurred in Gardena pass, involving the heavy banks of Cassian Dolomite rock and the underlying more plastic strata of the San Cassiano and Wengen formations.

