

The Geology of the Cabo de Gata area.

The volcanic mountains in this corner of Almería run from Cabo de Gata to Carboneras. They are late-Alpine in age, being erupted some 16 million years ago at the southern end at Cabo de Gata, and 8 m years ago to the north. They arose from the thrust of Africa against the crystalline massif of Iberia, and the frequent earthquakes (up to Magnitude 3.5) testify to this continuing pressure.

The rocks belong to the domain of continental volcanics; comprising typically reddish-brown and black andesites and lighter colour dacites. (Mt Etna on Sicily will exhibit the same range of rocks). House and street walls in the villages show all these rock types as well as anywhere. All sorts of structures are visible in the rocks, such as pillow lavas, volcanic bombs and columnar jointing (as in the Giants Causeway in Northern Ireland), well seen around the headland footpath between San José and Los Escullos and on the nudist beach near Monsul. Several periods of volcanic activity occurred, interspersed with long period of quiescence.

Calderas are where volcanoes collapse in on themselves after they have emptied their magna chambers by eruption. Some can be tens of miles across and filled by deep lakes. Three calderas exist between San José and Rodalquilar. The Fraile caldera, the oldest, lies between Cala Higuera and Los Escullos, and runs out to sea. The twin peaks of Los Frailes (491m) were the very last irruptions which capped the then partly-refilled caldera. The edge of the second caldera rims the rugged mountains around Rodalquilar, while the third and smallest caldera, located in the mountains behind the village, brought gold to the surface in pipes of pinkish, low density, aluminium-rich alunite. The gold was mined until the 60s, and the crushing plant and settling basins can still be visited above the village. (On no condition enter the mine workings. Shafts inside them go down to sea level and several people have died exploring them.).

Not all volcanic rocks are lavas. Continental volcanoes erupt huge clouds of hot, incandescent pyroclastic grey ash which sweep down the mountain sides at colossal speeds covering fields and villages (eg. Pompeii in AD 79 and the island of Montserrat in the Caribbean in the 1990s). These pale grey tuffs form Genoveses headland and occur behind the restaurant in San José port. A hand lens will show the rock to be composed of shards of natural glass together with black needle-like crystals of hornblende, formed as the incandescent cloud cooled. Often, these ash flows incorporate large irregular lumps, producing volcanic breccias, well seen and undercut on Monsul and Media Luna beaches.

During a quiescent period, when the sea was 200m higher relative to the land, shallow-water limestones were deposited in places around the volcanoes. Small pockets of these cream-coloured fossiliferous limestones, containing corals and shells, can be seen high on the mountain sides at this level, as far around as Hortichuelas, near Las Negras, but they are best seen 20m above the footpath which tracks around the headland beyond Cala Higuera. (These cream-coloured limestones are not to be confused with the greenish-grey deposits of bentonite which occur and are excavated in several parts. Bentonite is made of swelling clay minerals and is used to seal oil wells and sold commercially as cat litter.

Of particular interest, and a point of pilgrimage for visitors, are the cherry-red almandine garnets which lie in a dry stream bed near Nijar. This lies 4 kms to the east of Nijar where a V-shaped ravine cuts through the mountain wall. (a round white pozo (well) on the plain nearby marks the ravine). The garnets are never more than pea-sized but sometimes retain their distinctive dodecahedral crystalline form. Up through the ravine, is La Hoyazo (which the Spanish call el Volcan). This is a caldera-shaped hollow some 150 m across with a 20m cone in the centre made of soft bluish-grey rock stuffed with the garnets which form the stream bed downstream. La Hoyazo was not a true erupting volcano, but a volcanic emission on the sea bed. The cone is made of a very unusual rock called shoshonite. The emission reactivated deep-lying grey dacite containing big crystals of garnet

These are some of the geological points of interest in the San José area, But there are many more!

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