

DESCRIPTION OF TWO FERRUGINOUS ROCK BLOCKS IN AGIOS GEORGIOS

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I'm used to observing rocks in Antiparos during my holidays for over 20 years. In 2025, I compiled a short summary in the form of two PDF files, which can be found below.

<http://apreat.ovh/wp-content/uploads/2025/05/0.pdf>

<http://apreat.ovh/wp-content/uploads/2025/08/Aegean-Cyclades.pdf>

Having seen many of the rocks on the island, I came across two blocks that were not in place and are quite exceptional samples, which to my knowledge have never been reported.

They are located at the eastern end of the Despotiko Strait (Agios Georgios) at the contact between metamorphic limestones and volcanic tuffs and ashes in a north-south fault zone (according to the geological map). The limestone zone is narrow (100 m) and bordered to the west by gneisses and mica schists (metamorphic rocks). The limestone has been ferruginized, i.e. gradually transformed into hematite, and has been mined for Fe-Mn-Pb, extending northwards for about 300-500 m according to the geological map. This zone is densely covered with scrub and is difficult to access.

The two samples are not in place and one is partially submerged (= SAMPLE 1) at the eastern end of the beach, while the other (SAMPLE 2) is in the alluvial slope at the same end, at a height of approximately 1 m above sea level (see photos).

The limestones are heavily tectonized, laminated, fractured, jointed and brecciated. Numerous quite large blocks of white quartz fill the fractures and joints. These quartz blocks are not in situ, there are no veins present, and they probably originate from veins injected into the gneisses, as can be seen, for example, to the west of Livadi Bay. Here in the area concerned (at Agios Georgios), the mica schists and gneisses have been heavily altered.

The two SAMPLES (1 and 2) are therefore not in place and could correspond to an advanced stage of ferruginization (= ankeritization) of the limestones that were the source of the artisanal Fe and Mn mining operations noted at this location on the 1:50,000 geological map (1961).

SAMPLE 1. The sample is still on the shore, partly immersed, and belongs to a transported or reworked block that has become buried in sand and gravel. It consists of reddish and blackish rock with an irregular texture, laminated areas, heavily tectonized whitish areas and black veins. The main feature of this block is the numerous white calcite crystals that have developed from a discontinuity (bottom and top of a geode?) which they fill from the base to the top (depending on the current position of the block).

SAMPLE 2 (10 fragments). Same type as SAMPLE 1. After collecting and photographing it, I fragmented it to see its composition. All the blocks (dm) are fairly homogeneous, they can be described as follows: there are two types, type 1 is predominantly hematite, type 2 is predominantly calcite. The two minerals are also found together. The fragments are all dense and heavy due to hematitization.

Type 1. Grey to slightly blackish hematite in a regular palisade row of crystals 2 to 3 cm high and 2 to 3 mm wide, sometimes almost 1 cm. When the crystals are large, the recut hematite forms large clusters in slabs or 'plaquettes' measuring almost 1 cm x 1 cm. The crystals formed at the expense of a (metamorphic) limestone, tectonized (see tectonic veins), brecciated, light grey on the outside and orange-black on the inside. Coating of poorly individualized calcite crystals (>1 cm) on the outer (tectonic friction) surface.

Type 2: Very beautiful and abundant white lamellar/palisade calcite crystals and/or large rhombohedral patches up to 2 cm x 1 cm. The calcite is mixed with hematite. The limestone matrix is reddish, orange and black, and sometimes contains a very fine border (<1mm) of calcite microcrystals. A few rare calcite crystals contain matrix, suggesting that they developed from hematite-bearing limestone.

For both types 1 and 2 (SAMPLE 2) and for SAMPLE 1, the reddish and orange areas can be attributed to Fe, and the black areas and veins probably to Mn.

Nb : This is a macroscopic description made on site. No chemical analysis has been performed. This report does not address the diagenetic sequence of limestone ferruginization. The report is purely descriptive.

A PDF will be produced in October/November with all the photos taken.

Prof. A. Pr  at, September 2025



SAMPLE 1. Still in the sea at the easternmost end of the beach, Agios Gerogios. See description in the text.



SAMPLE 1. Still in the sea at the easternmost end of the beach, Agios Gerogios. See description in the text. Slight enlargement



SAMPLE 2. Reworked darkish/greyish rock block as it appeared (= position of discovery) in June 2025 in the alluvial deposit located 1.5 m above SAMPLE 1. The sample was fragmented into 10 pieces. See description in the text. Palisadic/acicular row well-developed calcite crystals.



Type 1, SAMPLE 2 (one of the ten fragments). See description in the text.



Type 2, SAMPLE 2 (two of the ten fragments). See description in the text.



Type , 1 SAMPLE 2 (one of the ten fragments). See description in the text.