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Information about the Environment and for travellers in Crete:

Small dripstone cave between Amnatos and Arkadi

Geo-Information **IV**: sinter forming: sinter tubule / cave pearls

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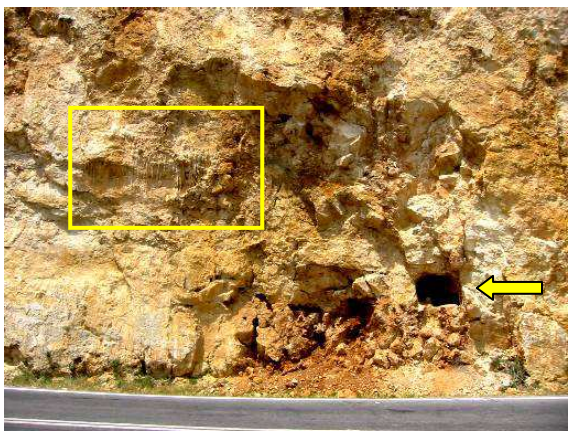
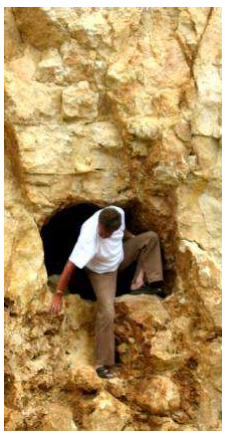
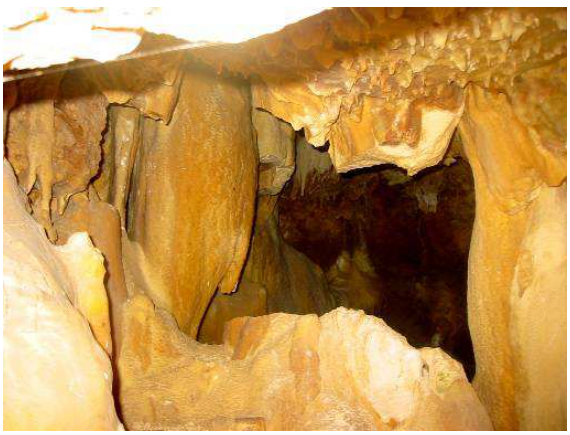
With reference to the info leaflet No.033-04/E (page 2) of the **CRETEEnvironmentInfo,** a small dripstone cave is described in the following, which was opened only recently by road construction activities.

The small cave is located directly at the newly widened road between *Amnatos* and the Monastery *Arkadi*. If one follows the signage from *Rethymnon* towards *Arkadi*, one drives at this route through the village *Amnatos*. Something about 2 miles behind this locality (and about 1.5 miles before Arkadi) the small dripstone cave is located on the right of the road in the steep wall of the mountain. The about 80 x 100 cm large entrance lies in about 1.8 m height above the road. From the outside now visible dripping and sinter formation at the newly cut mountain wall show that the small cave probably formerly belonged to a larger karst chamber system in the mountain, which was opened by the road enlargement (and denudation of the mountain wall). Through that relatively close entrance one arrives at further (4) chambers with an average size of approx. 120 x 180 cm which are connected to each other by short tunnels (of approximately 120 x 60 cm). The 2nd chamber features a ceiling scour of about 40 to 60 cm.
All chambers show very beautiful and form-rich sinter formations (dripstones [1]), active sinter tubes refer to “still increasing” stalactites. The dripstone cave is “small but mighty”!

[1)] Dripstones arise and grow, as far as is humanly possible to tell, very slowly. The exact speed however varies and depends on several factors: Lime concentration in the water, CO2-Gehalt in the water and in the cave, quantity of the down-dripping water and the temperature. By in the water loosened minerals dripstones can exhibit different colouring. Reaction equations: $CaCO_3 + H_2O + CO_2 <=> Ca^{2+} + 2\ HCO_3$ - or also $CaCO_3 + H_2CO_3 <=> Ca^{2+} + 2\ HCO_3$ – e.g. the growth of dripstones can be disturbed by cave visitors. If someone touches a dripstone, skin fat sets off and prevents at this point the future lime deposits. Therefore: “Look at yes, contact no”!







The pictures show (from left to right): the mountain wall at the road with the entrance opening (yellow arrow mark), sinter formations at the external wall (in the yellow marked rectangle); for size comparison with person and the 1st chamber of the small cave, whose sinter formations were damaged by the dismantling. Picture left shows the connecting "tunnel" between the 1st and 2nd dripstone chamber. Except from the 1st chamber the sinter tubes are still active in the remaining chambers i.e. still "growing dripstones"!

Pictures: (5629, 5630/29.07.2005) *U. Kluge* / (5375, 5376, 5381/29.07.2005)) *H. Eikamp*

Geo-Information **IV**: sinter forming: sinter tubule / cave pearls

The most known form elements of sinter formation are usually slim "**ceiling dripstones**" (**stalactites**) and the in majority more awkward "**ground dripstones**" (**stalagmite**). Stalagmites and stalactites can also **grow as columns** together and then become mentioned as **stalagnate**. The formation of a stalactite is lead by a sinter tube (see fig.). It often develops, where a cleft enters the cave ceiling and seepage water arrives in the cave.
There it deposits, out of one drop, about one- to two-thousandth milligram lime in form of a seam of about 4 to 6 millimetre in diameters, which approximately corresponds to one droplet size. By constant drip the seam grows up to a long and inside hollow sinter tube which is, because of its appearance, also called "macaroni".

The by far rarer cave pearls (see fig.) are roundish formations with concentric-shelled structure and diameters up to 20 mm. They develop in places, where water drip down in flat basin. Here calcite separates from the solution, in fact around a condensation nucleus from sediment particles, rock or crystal fragments. The down-dripping water constantly moves the "increasing" cave pearls, so that they cannot crust at the soil. Fluctuations within the yearly rhythm thereby often produce a "ring sample", which closely resembles the annual rings of trees.

The picture left shows sinter tubules in the size of 70 to 90 mm length; the pictures right a cave pearl from the outside and "inside"; its diameter is 19.58 mm
The pictures of the sinter tubules and the cave pearls are from the ***Eileithyia*** cave at ***Amnissos***, North Crete; therefore see our info-leaflet No. 014-04/E at the **CRETEEnvironmentInfo**

Picture Sinter tubules: (5235/27.07.2005) *Karl Eckl* / **Pictures** (and collection) **cave pearls**: (5534, 5537/27.07.2005) *Ute Kluge*