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Hoofprints of *Myotragus* at S'Estret des Temps

Location



Municipality: Santanyí

U.T.M. coordinates (31N ETRS89): X: 515420
Y: 4353843



Difficulty and duration



5 min

Access

Going from Santanyí towards Cala Figuera (Pm-6102), turn off towards S'Amarador-Cap des Moro at km 2.9. Continue for 1,6 km until you see a sign to the right for S'Estret des Temps. The access to the quarry (where the hoofprints of *Myotragus* are found) is on the right-hand side just where the road begins to run parallel to the coastal cliffs, approximately 1,2 km from the last turnoff.

Principal interest

Paleontological

Secondary interest

Geomorphological, stratigraphic

Description of the locality

The quarry of S'Estret des Temps is famous for the existence of an important paleontological site preserved in the dunes which during the Pleistocene developed in many coastal zones of Mallorca. The material that forms them is the typical sandy limestone known in the Balearics as *marés*.

Because *marés* is abundant in the zone, it was exploited in several quarries, which allow clear geological sections to be seen in their walls, showing the undulating morphologies and cross-stratification typical of dunar deposits, formed by the action of the wind some 40,000 years ago. The fossil dunes of S'Estret des Temps adjoin some ancient cliffs formed by rocks from the Upper Miocene, of some 6 Ma ago.



Spectacular cross-stratifications in the walls of the quarry.

In this period, in which the island's climate was cold enough for the sea level to be several metres below its present-day level, the zone was inhabited by an autochthonous bovid of the Balearics: the *Myotragus balearicus*.

Recreation of *Myotragus balearicus* in S'Estret des Temps
(taken from Fornós *et al.* 2002).



The hoofprints (technically named ichnites) of this animal, fossilised by the dunes, were exposed during the quarrying operations for extracting *marés*. It was not until the 1980s that scientists became aware of the existence of this type of fossils in a material that was not very appropriate for their preservation.

The clearest prints can be seen on the stratification surface of the *marés*, in circular shapes and grouped into the form of a track, which indicates the route taken by a particular individual. At the beginning of this century it was decided to give this type of ichnites a scientific name, *Bifidipes aeolis*.



Two views of hoofprint tracks with their characteristic shapes a circular tendency.

In the quarry of S'Estret des Temps we can see hoofprints not only on the surfaces of the calcarenites but also in the vertical embankments, in the form of concavities which break the horizontal laminations of the calcarenite, along with root moulds of the plants that lived on the dunes.



Hoofprints in transversal section.



Root moulds.



View of the cliff: the whitish marls with root marks on the mangrove facies, and the orange-coloured oolitic limestones of Santanyí.

The cliffs surrounding the quarry are formed by rocks of the Miocene belonging to the Santanyí Formation and correspond to ancient mangrove swamps, tropical coastal zones populated by mangrove trees, which are very resistant to saltwater. The moulds of their roots still survive along with some fossils of molluscs in levels of whitish marls. Above these there are levels that mark a replacement of the mangrove swamp by extensive plains moulded by the action of the waves. This upper section is composed of a type of rock called oolitic limestone, which contains remains of biological activity technically named bioturbations.



Detail of the fossils of bivalves in the marls of the mangrove facies and the bioturbations in the oolitic limestones.

For more information

Fornós, J.J., Bromley, R.G., Clemmensen, L.B., Rodríguez-Perea, A. 2002. Tracks and trackways of *Myotragus balearicus* (Artiodactyla, Caprinae) in Pleistocene aeolianites from Mallorca (Balearic Islands, Western Mediterranean). *Palaeogeography, Palaeoclimatology, Palaeoecology*, 180 (4): 277-313.

Fornós, J.J., Pons-Moyà, J. 1982. Icnitas de *Myotragus balearicus* del yacimiento de Ses Piquetes (Santanyí, Mallorca). *Bolletí de la Societat d'Història Natural de les Balears*, 26. 135-144.

Recommendations

It is advisable to take a hat, water and comfortable footwear. Take great care when walking on the paleodunes of the quarry (not suitable for vertigo sufferers).

The visit can be made at any time of year, but on stormy days the weather may prevent access to the *Myotragus* hoofprints. If you visit in summer you can enjoy a swim nearby.

It is interesting to follow the Itinerary of Geological Interest of the Cliffs of the Santanyí zone, or alternatively to visit the SGIs of Es Pontàs and of the Mirador d'Es Pontàs, and also Cala Santanyí, where you can see the Santanyí Limestone Formation.