

Cerro del Castillo

From an ancient Cambrian seabed to a living cave

A one-day field trip in Aracena, at the heart of the aspiring Iberia/Ibérica UNESCO Global Geopark, tracing the imprint of metamorphism in 500-million-year-old marbles, examining deformation structures, observing external and internal karstification processes, exploring the “Gruta de las Maravillas”, and learning the regional geological history.



Cambrian marbles at Cerro del Castillo (Aracena)

TRIP DETAILS

Format	One-day trip (extendable)
Duration	~6–7 h · 09:30–17:00
Group size	8–18 people
Level	General public to specialist
Languages	Spanish / English
Season	Year-round (the cave sits at 16–19 °C)
Base	Aracena, Sierra de Aracena y Picos de Aroche (Huelva)
Guide	Helena Chacón, PhD geologist

THE GEOLOGICAL SIGNIFICANCE

Cerro del Castillo, in the heart of Aracena, is a hill of Cambrian calcium carbonate. It originated as a shallow marine seabed that was recrystallised into marble during the Variscan orogeny, when the continental blocks now known as the Ossa-Morena and South Portuguese Zones collided, forming a suture still recognisable across the southern Sierra de Aracena. Over hundreds of thousands of years, water has dissolved the limestone, carving out passages that today form one of the finest caves in Iberia: “La Gruta de las Maravillas”.



Above: Cerro del Castillo. Below: Gruta de las Maravillas. Photos courtesy of www.soyecoturista.com

THE FIELD TRIP: STOP BY STOP

09:30 - STOP 1: Field notebook

We begin by sketching the various lithologies and deformation structures in the marbles. This sharpens our observation skills, our eye for detail and our compass-based data collection - followed by a short, hands - on session on turning field observations into a professional-standard illustration.



Left, taking notes and sketching in a field notebook. Right: photograph of boudinage deformation structures. The finished illustration of these structures appears in the next page.

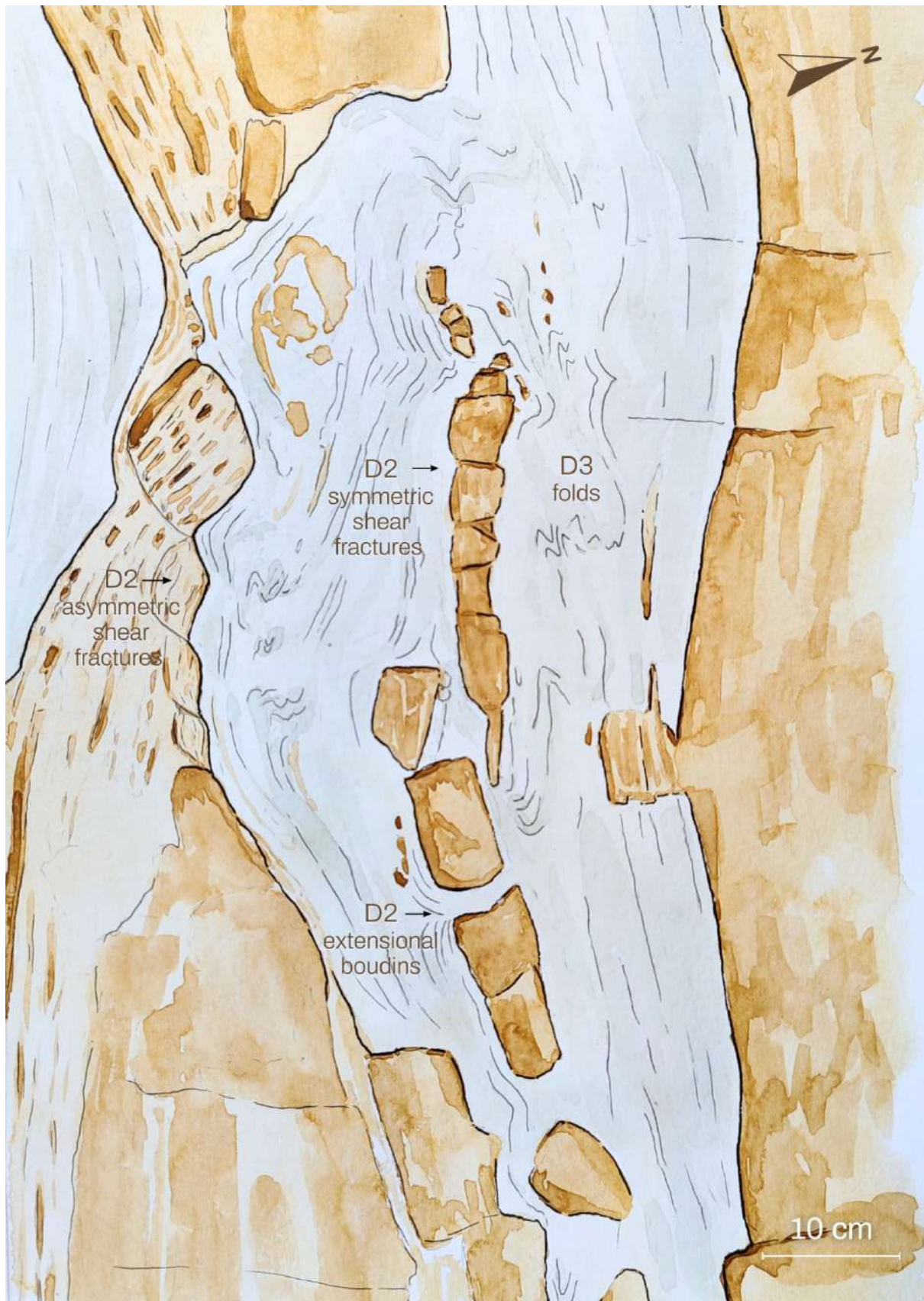


Illustration of the boudinage deformation structures. Shown in pale grey, the ductile Cambrian marbles; in orange and earth tones, the more competent calc-silicate rocks.



Photograph and illustration of the contact between the Cambrian marbles and the anatectic granite, showing the landscape shaped by contrasting lithologies: marble with dissolution fissures and positive relief, and granite in rounded corestones with sandy weathering residue and negative relief.

11:00 - STOP 2: Geological interpretation

Our geological interpretation is built up in stages:

1. Regional geological setting - the Aracena metamorphic belt and the surrounding lithologies
2. A tectonic account of the boudins and other deformation structures in marbles
3. Karst. Observing external karstification features and the origin of the “Gruta de las Maravillas”
4. Observing and interpreting the landscape
5. The historical setting of the Castle and the church



Clockwise from top to left: 1. Deformation structures in marbles; 2. Exokarst; 3. Landscape interpretation; 4. Outcrop at Cerro del Castillo

13:00 - STOP 3: Museum - minerals, fossils and the Black Room

Housed in the former 1925 water reservoir - once fed by the caves own aquifer - the Geomuseum holds more than 2,300 specimens of minerals, rocks and fossils, together with Europes largerst 'Black Room' of fluorescent minerals: a controlled way of connecting the local rock with the wider mineral world through some remarkable regional specimens.



Photographs taken at the Aracena Geomuseum

14:00 - 16:00 - LUNCH: Tasting local mountain specialties and break
Lunch featuring local Sierra produce, followed by free time to stroll through a historic town center built in marble.

16:00 - STOP 4: Gruta de las Maravillas – inside the marble

We descend into the cave beneath Cerro del Castillo: a three-tiered phreatic karst system (around 2230 m of passages, of which some 1200 m are open to visitors), rich in speleothems - including rare blue aragonite eccentrics and floating calcite rafts - with still lakes marking the water table. Constant temperature of 16-19 °C



Gruta de las Maravillas. Photo courtesy of zapasviajeras.com

WHAT'S INCLUDED · HOW IT WORKS

- ✓ A full day guided by a Phd Geologist
- ✓ Route adaptable to the group
- ✓ Activity materials are not included. We recommend bringing a notebook, pencil, eraser, coloured pencils or a portable watercolor set, a compass and a hand lens
- ✓ On request, the quote can include accommodation in the Sierra, coach transfers, and admission to the Gruta de las Maravillas and de Geomuseum

LEARNING OUTCOMES (academic groups / CPD)

- In situ observation of rocks from the Aracena metamorphic belt
- Recognising and identifying deformation structures and interpreting them within the regional geological framework
- Understand karst development and speleothem formation in a real cave
- Practising field observation and geological sketching as tools of interpretation

EXTENDING IT — A THREE-DAY GEOPARK PROGRAMME

This trip is one example of a one-day itinerary exploring a single Geosite within the Iberia/Ibéria Geopark Project. Longer trips are also available, taking in other Geosites - such as our sample three - day programme covering Riotinto, its mining heritage and its Mars analogue river; the Acebuches metabasites, which mark the Ossa-Morena / South Portuguese suture; and a third day chosen between Peña de Arias Montano, a living example of travertine formation and hydrogeology, or the northern Sierra, less metamorphosed and home of the fine examples of pillow lavas, stromatolites and more.
