

EXCURSION TO THE ASTURIAN EASTERN COAST

9:00 Departure from Gijón/Xixón (Polytechnic School)

Food and water will be provided. Bring clothes for warm weather, sturdy shoes, hat & sunscreen, a swimsuit (optional) and a raincoat (depending on weather).

COASTAL FORESTS AROUND SANTU MEDÉ

10:30 Arrival to the Santu Medé lighthouse

11:00 First stop in the holm-oak forest above the cliffs

Evergreen Lauroid-Mediterranean forests (*Laurus*, *Olea*, *Quercus*, etc.) taking advantage of the warm winters throughout the Quaternary (with much lower sea level and more room for warmer conditions caused by low elevation) and the permeable limestone bedrock, allowing for a fast and efficient drainage of the relatively abundant rainfall.

Such permeability depends on the solubility and porosity of the rocks by the slightly acidic rainwater, producing underground crevices and, more generally, generating remarkable karstic landscapes (a mere advance here, further explanations in Buelna).

Understory plants, the Mediterranean influence being buffered by the relatively cool summers and the shadow of the trees, are more similar to those of conventional western European deciduous forests.

Sea-spray explains the abundance of halophytes in the forest clearings and fringes.



Quercus ilex

11:30 El Pindal Cave

Among these karstic features are caves with remarkable parietal art produced by *Homo sapiens* (another relict species in this refugium).



11:45 Forests around the church of Santu Medé



Deciduous forests with more conventional Atlantic European flora (but including quite a few Iberian endemics) on siliceous, less permeable bedrock (quartzite and sandstones).

Religious traditions in the area (a medieval eremitic monastic community, etc.) contributed to the preservation of forests, in contrast with the highly deforested landscapes of the adjacent coastal plains, dedicated to cattle rearing, produce gardens and orchards.

The abundant rainfall readily erodes and lixivates soils after deforestation, exacerbating the intrinsic acidity and oligotrophy of the siliceous bedrock and promoting the appearance of heathlands.

12:15 Back to the bus

LA FRANCA BEACH

12:30-14:00 Lunch and leisure in La Franca beach

Free time to have lunch, explore the geomorphology of the beach at the low tide, and/or take a bath. Bars and restrooms available.

CLIFFS, INLAND BEACHES AND ESTUARIES AND OTHER KARSTIC FEATURES NEAR BUELNA

14:15 Arrival to Buelna village

14:30 El Molín inland estuary



An ancient cave excavated by the combined effects of the waves and the acidic water, whose ceiling fell, leaving behind a basin connected to the sea and inundated with every tide. A freshwater course flows into the basin through its opposite side, resulting in a peculiar inland estuary harboring a minute mosaic of intertidal brackish water communities, including maritime rush banks, muddy *Salicornia* stands, *Zostera* meadows and *Fucus* belts.

By the channel communicating with the sea, through which tide currents flow, a now abandoned water mill was built.

15:00 Sea cliffs



The limestone platforms or *rasas*, flattened by the sea before being tectonically lifted, contact with the sea in vertical cliffs, with plenty of caves, crevices and holes, corresponding to different stages of the erosive processes leading to dolines like the one we've just visited. When narrow enough and conveniently positioned, storm waves fill them with pressurized water, generating spectacular ejections reminiscent of geysers [locally *bufones*, from *bufar* (to snort)].

Along our walk we'll find many specialist plants, resistant to the windy, rocky and somewhat salty conditions prevailing in these areas.



15:30 Cobiheru beach

Another doline regularly invaded by the tides, but with no input of freshwater and muds, therefore functioning not as an estuary but as an inland sandy beach.

Along the path leading back to Buelna we'll find many alien invasives and several streams flowing into caves, representing early stages towards the formation of inland estuaries like the one we've just visited.



16:00 Back to the bus

SUBTROPICAL RELICTS AND BIOGEOGRAPHIC MIXES IN COASTAL RAVINES

16:10-17:00 Novales river valley

The warm winters and humidity of the general climate are enhanced in narrow valleys, where both topography and tree cover combine to neutralize the only source of frost in these coastal areas (irradiation during long, clear winter nights) and maintain permanently humid conditions. This has enabled the survival of a significant number of subtropical plants, especially ferns, among which the case of *Calcita macrocarpa*, the one we'll be visiting here, is particularly striking. However, the proximity of relatively high mountains and the moderate, cloudy and never too hot summers allow for the existence of low-elevation populations of mountain plants, generating occasionally perplexing co-occurrences. As we'll see, *Eucalyptus* forestry, another consequence of the warm-temperate conditions, is a widespread activity, threatening some of these remarkable botanical hotspots.



18:00 Les Mestes



A brief visit to a riverine forest harboring another remarkable subtropical fern species (*Woodwardia radicans*).

18:15-19:15 Leisure time in Tazones

Tazones is an old fishing village, famous for its ancient whaling activity, its black amber crafts, the dinosaur footprints in the rocks of its beach, its relatively well-preserved traditional architecture and its seafood restaurants and cider taverns.

19:30 Back to Gijón/Xixón (stops at city centre)
