# Velilla de Valdoré

This is the first day of the mapping campaign. We will follow a 6 km itinerary along good tracks, collecting geological information in stops of special interest, whose description follows.

## 1.1

Coordinates are 42.87084 N, 5.16913 W.

Small outcrop on the track cut, consisting of massive dark-brown shales with a very penetrative lamination. No fossils are found. Bedding 035/18.

TASK: From here, looking north, there is a very good view of the other side of the valley, where several thick limestone units can be identified. Draw an sketch of the view on your notebook, identifying the main lithological units.

PANORAMIC PHOTO.

## 1.2

Coordinates are 42.87242 N, 5.17215 W.

Contact between dark-brown shales with penetrative lamination and grainstones with trough cross-lamination. Grains are formed largely by echinodermal ossicles. The contact is locally affected by a normal fault with some 3 m throw.

TASK: Calculate the dip direction and dip of the contact between both lithological units, based on the location and height of three outcropping sites. Does your calculation match what you would expect by looking at the map?

PANORAMIC PHOTO and SKETCH.

## 1.3

Coordinates are 42.87616 N, 5.17424 W.

Massive mudstones, gray-coloured, with locally abundant reefal fauna, including tabulate corals, stromatoporoids, brachiopods, bryozoan, and crinoids. Locally some bedding is observed, but otherwise it forms a 10-15 m-thick massive interval.

TASK: Give an approximated dip direction and dip for the limestones, making use of the V-rule.

## 1.4

Coordinates are 42.88262 N, 5.17821 W.

Outcrop of light-beige marls with thin grainstone intercalations, with a thickness in the order of 5-10 cm. Grainstones are formed by bioclastic fragments of echinoderms and corals, largely. The marls have provided nice specimens of a brachiopod identified as *Athyris sp.*

Bedding plane is: 065/45

PHOTO OF ATHYRIS AND CHRONOSTRATIGRAPHIC TABLE AND BEDDING DATA.

## 1.5

Coordinates are 42.88304 N, 5.17810 W.

In this location, two different lithologies are in contact with one another through a highly deformed interval with a total thickness in the order of 1.5 m.

The lowermost lithology is formed by dark red marls and shales with intercalated nodular pink mudstones and wackestones with scarce skeletal content. The fossils are predominantly crinoids. The nodules appear slightly sheared on the uppermost part, with developed shear bands.

On top of that, there is an interval of about 30 cm formed by an extremely fine-grained rock. It is very resistant and compact. It is massive in appearance, but it is internally structured into mm-thick laminations, locally folded. Scattered within the laminated rock there are disrupted lenses of mudstone, locally boudinaged.

On top of the fine-grained rocks, there is an interval of about 1 m formed by breccias. The fragments are varied in size, with a maximum of about 4 cm and an estimated average of 1 cm. The fragments are largely derived from light-gray limestones, but dolomite fragments are also present. They are strongly angular, and often display their largest dimension subparallel to bedding.

On top of the breccias, there are light-gray mudstones with frequent calcite-filled birdseyes. In fresh cut they are light coloured as well. Bedding planes are tabular and range in thickness between 15 cm and 30 cm.

Bedding is 068/34

PHOTO, SKETCH AND BEDDING DATA

## *1.6*

Coordinates are 42.88393 N, 5.17818 W.

In this location there are light-gray grainstones containing mostly echinoid ossicles fragments. Grain size can reach several mm. Scattered rounded glauconite grains are locally very abundant. In fresh cut they are very light gray, slightly greenish. Bedding planes are tabular and range between 10 and 20 cm in thickness. A certain horizon is rich in Archaeocyathus laqueus.

PROVIDE PHOTOS AND CHRONOSTRATIGRAPHIC TABLE

## *1.7*

Coordinates are 42.88414 N, 5.17787 W.

In this location there is a significant colour change on the track floor, from gray to red. This is likely related with the rocks underneath, and surely enough, this is confirmed some metres afterwards. On the track, different rocks crop out. They are coloured pink nodular wackestones and red-coloured marls and shales. In fresh cut their colour is considerably faded. Locally their nodular character is not so obvious. Bedding planes are relatively thin, usually between 5 and 15 cm.

Bedding is 025/22.

PROVIDE BEDDING PLANE

## *1.8*

Coordinates are 42.87947 N, 5.17926 W.

Brown-coloured massive shales with very penetrative lamination. They are easily crumbled, and completely devoid of vegetation.

Bedding is 064/10.

PROVIDE PICTURE AND BEDDING PLANE

## 1.9

Coordinates are 4.88347 N, 5.18650 W.

Ever since the stop 1.8, all the outcrops consist of brown massive shales, locally with some sandstone intercalations, usually restricted in thickness to a few centimetres, no more than 10 cm.

Here, the outcrop consists of sandstones, very rich in quartz, often with carbonate cement, which are light-beige coloured in fresh cut. They are organized into tabular beds with a variable thickness between 15 and 40 cm. They display both parallel lamination and cross-lamination. Brown shale intercalations are frequent. A good brachiopod specimen was found, identified as Paraspirifer sp.

Bedding is 112/72.

SKETCH HIGHLIGHTING YOUNGING, PHOTO OF FOSSIL, BEDDING

## 1.10

Coordinates are 42.88409 N, 5.18725 W.

Wackestone light gray limestones. The beds are tabular, laterally continuous, and with a regular thickness in between 10 and 20 cm. Some levels are packstone, with abundant crinoids, corals and brachiopods. This fauna is easily identified due to the fact that it is silicified.

Bedding is 121/78.

BEDDING DATA