

Wenlock-Pridoli (Silurian) strata in the Llesui section

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Locality - In the parking area of the former sky lift.

Lithostratigraphic unit - Black shales and ochreous limestones. Llesui Limestones.

Age - Sheinwoodian, Gorstian (Wenlock, Ludlow graptolite Zones 28-33; Silurian) and Pridoli.

What to see - Characteristic development of the "Llesui" Upper Silurian limestone facies ("Ockerkalk").

How to get there

The locality is accessible from the paved road connecting Llesui with the former sky resort (Fig. 1). Along the road some Wenlock black shales crop out. In the parking lot Wenlock shales and Ludlow?-Pridoli limestones are exposed. Hiking up the dirty road towards Santa Bárbara Wenlock and Ludlow black shales and ochreous Pridoli limestone can be observed.

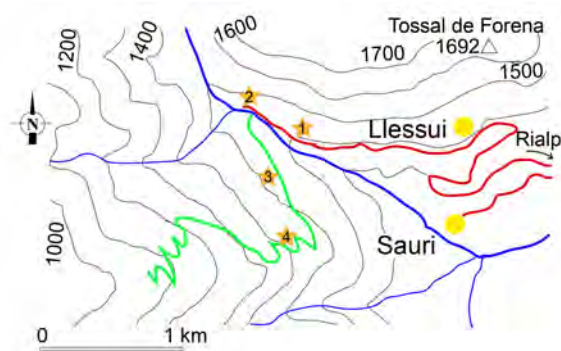


Figure 1. Location map of Llesui outcrops. 1-4 position of different outcrops. 1) Wenlock black shales. 2) Ludlow and Pridoli Ockerkalk type limestone and Wenlock black shales. 3) Pridoli limestones interbedded with shales. 4) Ockerkalk-type limestone.

The "Ockerkalk" facies type was interpreted as a condensed deposit, deposited in a quiet environment below wave-base (Barca et al., 1995). The ample bioturbation in many beds can be interpreted as an oxygenated level several centimetres below bottom-sea (Sanz-López et al., 2002b).

Fossil content

Degardin (1988) identified graptolites in four sites around this area; they correspond to his "Gisement" 91-94 that contain the following taxa: *Monograptus priodon*, *M. flemingii*, *M. flexilis flexilis*, *Monoclimacis vomerina vomerina*, *Mcl. Hemipristis*, *Pristiograptus sardous*, *P. dubius*, *M. unquiferus*, *Saetograptus (Colonograptus) colonus colonus* and *S. (C.) varians varians*.

Degardin (1988) also identified the following conodonts in his "Gisement" 21-23: "*Ozarkodina typica denckmanni*", "*Spathognathodus steinhornensis eosteinhornensis*", *Ligonodina elegans*, *Pseudooneotodus* sp., *Trichonodella excavata*, *Belodella resima*, *Bel. sp. A*, *Lonchodina detorta*, *Neoprioniodus latidentatus*, "*Spathognathodus crispus*", "*Oz.*" *media*, *Plectospathodus extensus*, *Synprioniodina silurica*, *Hindeodella priscila*, "*Oz.*" *edithae*, *Roundya trichonodelloides*, *Hindeodella equidentata* and *Lonchodina greilingi*.

We have also collected conodont samples in the area, but only *Wurmiella* sp. could be identified.

Historical outline

Degardin (1988) studied this area and identified Wenlock and Ludlow graptolites and Pridoli conodonts in several sites. Sanz-López et al. (2002a, b) considered the Llesui Limestones as the Ockerkalk type. In the latter paper a Ludlow-Pridoli age was assigned to this Limestone.

Lithology and fossil content

Black graptolitic shales with dark-grey nodular bioturbated limestones with shale interbedded (Fig. 2). Ortoconic nautiloids, crinoids, bivalves, ostracods and a few trilobites are found in the limestones.

Palaeoenvironment

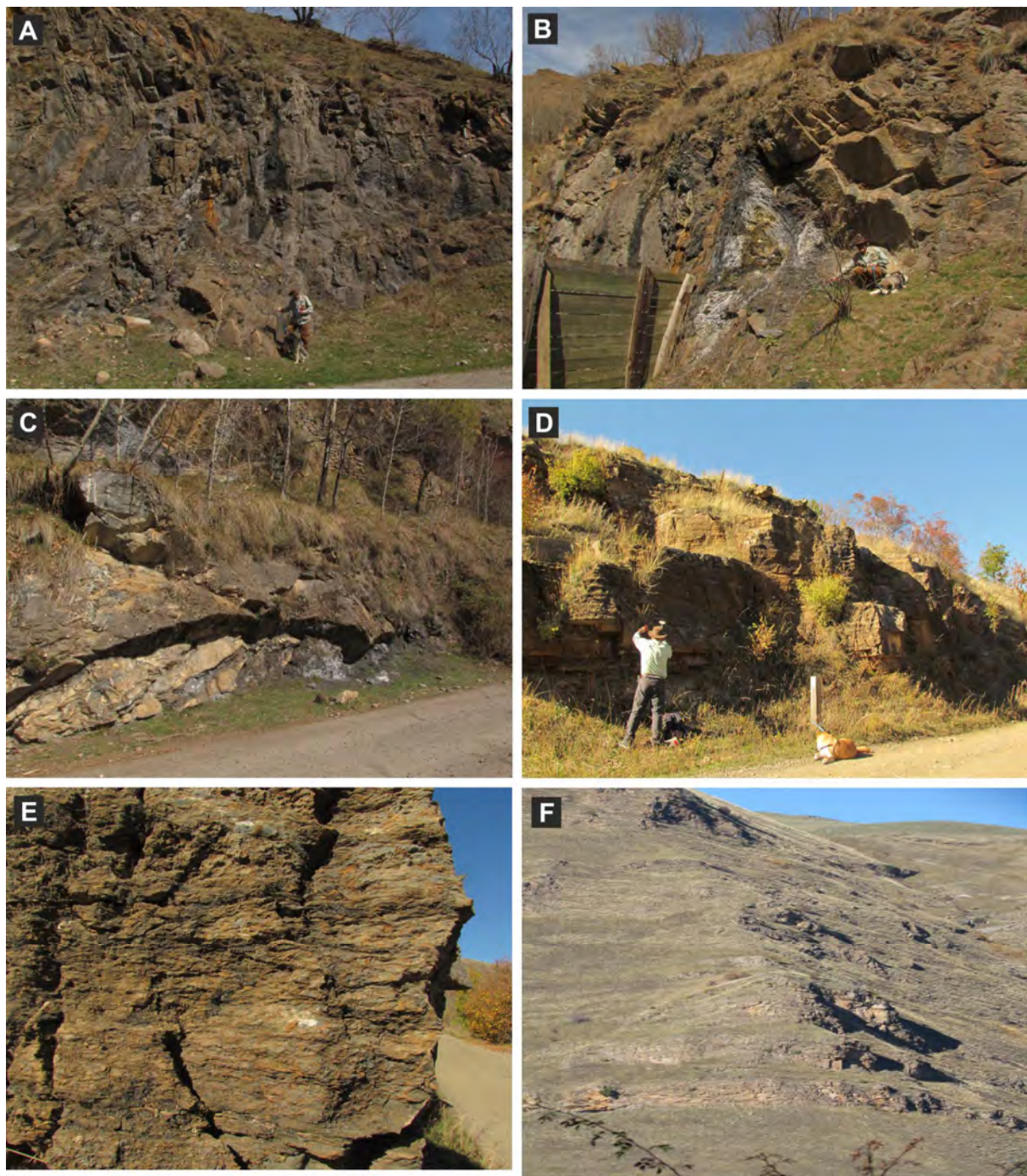


Figure 2. View of the Llesui outcrops. **A.** Folded Llesui limestone at outcrop 2 (Ludlow?-Pridoli). **B.** Limestone-shale contact at outcrop 2. **C.** Graptolitic black shales of outcrop 1 (Wenlock). **D.** Outcrop of the Llesui Limestone at outcrop 4 (Pridoli). **E.** Detail of the Ockerkalk Llesui Limestone at outcrop 4. **F.** Landscape view of several tectonically repeated belts of Llesui Limestone within the black shales.

Biostratigraphy

According to Degardin (1988) the graptolite association correlates the black shales with the Zones 28-30 of Elles & Wood, in the upper Sheinwoodian, upper Wenlock and 33, in the Gorstian (Ludlow). The conodont association was attributed to the Pridoli (Degardin, 1988); however, the occurrence of "*Oz. crispa*" in sample F405 of his Outcrop 21 would be placed in the upper Ludlow.

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