**Rendiconti della Società Paleontologica Italiana**

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(II)

# Time and Life in the Silurian: a multidisciplinary approach

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# Field Trip Guide Book

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# Wenlockian graptolites and the Lower Graptolitic Shales-Ockerkalk transition East of Lantini Tunnel near Ballao (SE Sardinia)

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| | |
|---|---|
| LOCALITY | a road-cut section east of Lantini Tunnel (between and 39°32' 22.1"N, 9°23'08.8"E and 39°32'21.7"N, 9°23'19.4"E). |
| LITHOSTRATIGRAPHIC UNIT | Lower Graptolitic Shales and Ockerkalk limestone (informal units). |
| AGE | middle and late Wenlock, Ludlow-Pridoli. |
| WHAT TO SEE | middle and late Wenlock graptolites in a structurally complex section; Upper Graptolitic Shales-Ockerkalk transition. |

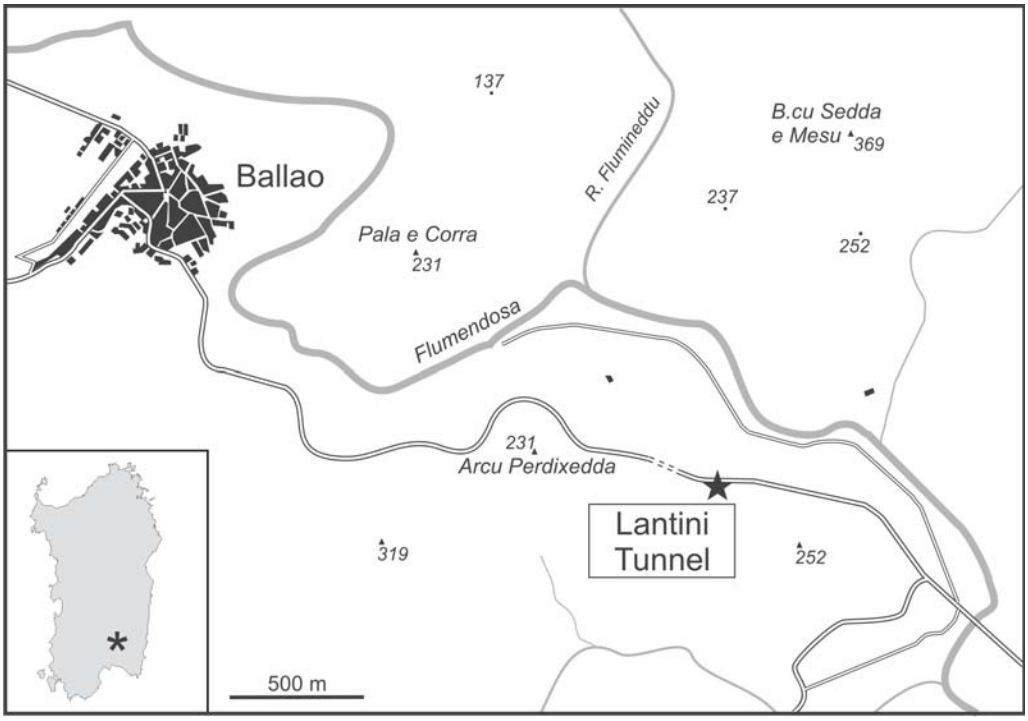


Fig. 1 - Location map of the Lantini Tunnel Section

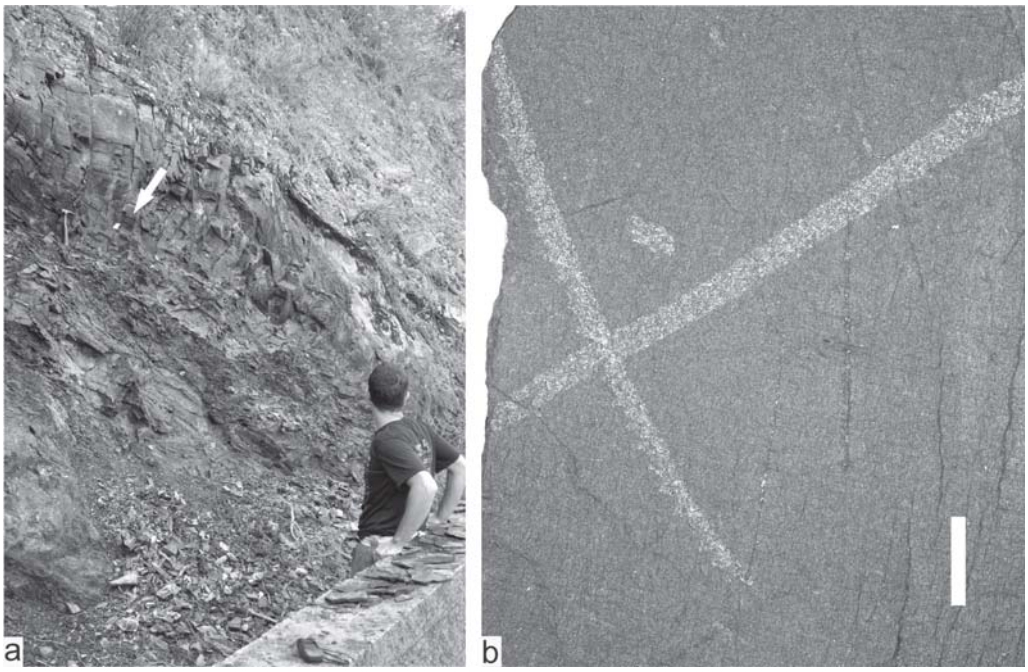


Fig. 2 - a) Mid-Wenlockian part of the Lower Graptolitic Shales tectonically juxtaposed with the overlying Ockerkalk limestone. White arrow and hammer indicate slates, moderately affected by cleavage, with graptolites of the *M. riccartonensis* Biozone, succeeded by more silty beds with *Pristiograptus dubius* (Suess) and ?*P. latus* (Boucek). b) *Monograptus riccartonensis* Lapworth, Scale bar = 5 mm.

## How to get there

The Lantini Tunnel section is a large exposure situated 2.5 km southeast of Ballao, on the right side of road SS387 to Muravera, c. 50-250 m east of the eastern face of Lantini Tunnel.

The section is tectonically complex and exhibits soft, black alum shales of several stratigraphic intervals, middle and late Wenlock in age. The exposure is particularly important by its gradual upward transition from graptolitic alum shale to the Ockerkalk limestone (Fig. 3).

## Historical Outline

This section was first examined by research team of Enrico Serpagli in the late nineties, but it is described here for the first time. Graptolite occurrences and stratigraphy have been reported by Storch & Piras (2009).

## Lithology

Thin-bedded alum state of middle and upper Wenlock intercalates with several pyrite-rich, muddy limestone beds and two 0.2 m thick beds with nautiloid shells in the uppermost

part of the Lower Graptolitic Shales unit, just below the pyrite-rich limestones at the base of the Ockerkalk limestone. Typical argillaceous limestone with flaser-texture is developed in the higher part of the Ockerkalk succession.

The gradual transition from the Lower Graptolitic Shales to the overlying Ockerkalk is observable in the section (Fig. 3) which is one of the few localities where it happens, since the two units are commonly detached by the strong tectonic deformation which affected the region.

## Fossil content

### *Graptolites*

Graptolite fauna of *M. riccartonensis* Biozone was encountered in the western part of the road-side exposure, 50 metres east of the tunnel face. The fauna comprised *Pristiograptus dubius* (Suess), ?*Pristiograptus latus* (Boucek) and common *Monograptus riccartonensis* Lapworth. The latter species is missing whereas pristiograptid rhabdosomes proliferate in the overlying *P. dubius* Biozone.

East of this point, another tectonically separated block yields thin-bedded alum shale with *Pristiograptus pseudodubius* Boucek, *P. dubius*, ?*Monoclimacis flumendosae*, "*Streptograptus*" cf. *retroflexus* (Tullberg), *Cyrtograptus ramosus* Boucek or *Cyrtograptus*

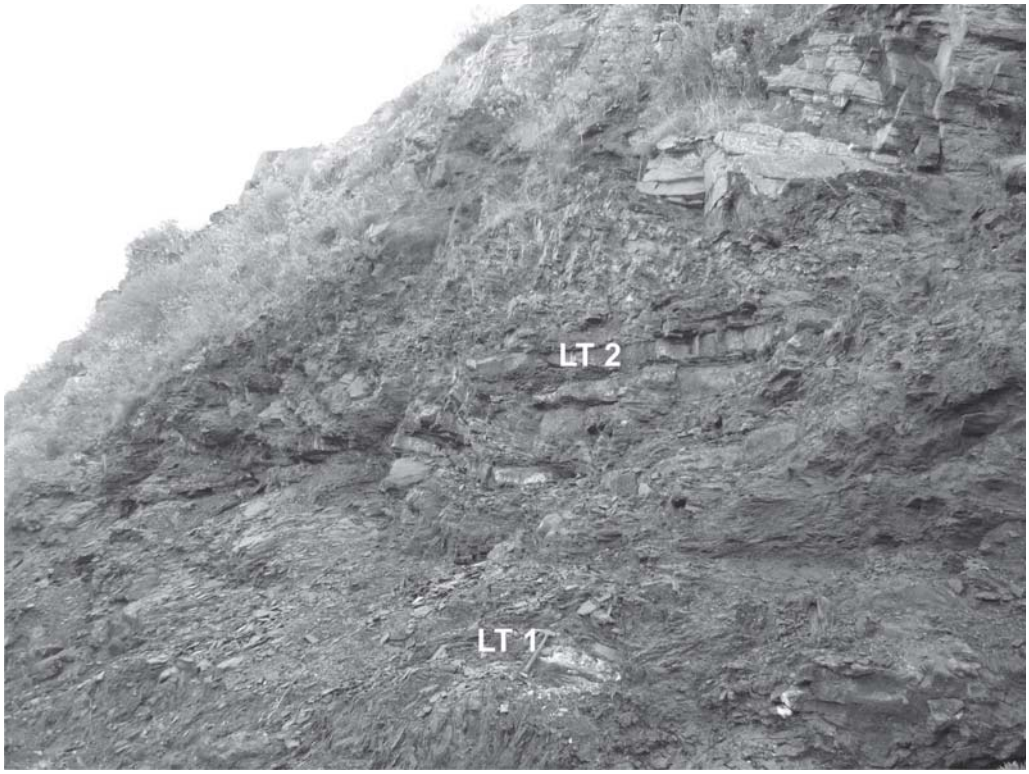


Fig. 3 - Gradual transition from the Lower Graptolitic Shale to the Ockerkalk limestone. Lenticular limestone beds, designated LT 1 and LT 2, indicate levels sampled for conodonts.

*ellesae* Gortani and *Diversograptus gracilis* (Boucek) – the assemblage assigned to *Cyrtograptus ramosus – Cyrtograptus ellesae* Biozone.

Middle part of the road-side exposure yield determinable rhabdosomes of *P. dubius*, *Monograptus flemingii* (Salter), *Monograptus belophorus* (Meneghini), *Monoclimacis flumendosae* (Gortani), and „*Streptograptus*“ *antennularius* (Meneghini) indicating the presence of *Monograptus belophorus – Cyrtograptus rigidus* Biozone.

Black alum slates that underlie and intercalate limestone beds below Ockerkalk succession in the easternmost part of the exposure yield common but badly preserved robust rhabdosomes of *P. dubius* and *Colonograptus* cf. *ludensis* (Murchison) vel. *C. gerhardi* (Kuehne).

Some undeterminable orthoconic nautiloid shells were found in limestone beds and nodules in the uppermost part of the shaly succession.

### *Conodonts*

The first two carbonatic lenses, still within the shales, just below the Lower Graptolitic Shales-Ockerkalk transition were sampled for conodonts (Fig. 3). Unfortunately the results were definitely lower than expected: the lower sample was barren, whereas the upper one yielded only scarce and poorly preserved specimens of *Wurmiella excavata* (Branson & Mehl) and *Oulodus* sp.

## Biostratigraphy

*Monograptus riccartonensis*, *Pristiograptus dubius*, *Monograptus belophorus – Cyrtograptus rigidus*, *Cyrtograptus ramosus – Cyrtograptus ellesae* and *Colonograptus ludensis – Colonograptus gerhardi* graptolite biozones in a tectonically complex, discontinuous succession.

## References

Storch P. & Piras S. (2009). Silurian graptolites of Sardinia: assemblages and biostratigraphy. *Rendiconti della Società Paleontologica Italiana*, 3 (1): 77-93.