

Tuscan Nappe
Calcare Cavernoso (CCA)
Upper Triassic (NORIAN P.P. – RHAETIAN P.P.)
Dolomitic limestone and polygenic breccia

Outcrop located along the road “strada provinciale 61” from Molina di Quosa village to Quattro venti locality, south slope of Mt. Parignana.



Small outcrop along the roadside. Greyish tectonic breccia made up of limestone and dolomitic limestone with well developed “vacuolar texture” due to gypsum dissolution.

MOS 1

43°47'58.18"N, 10°26'05.72"E



Vacuolar dolomitic limestone with rounded or subrounded cavities due to dissolution of gypsum.



Recrystallized fine-grained carbonate matrix ($10 < \mu\text{m}$) with coarse-grained carbonate clast and calcite veins. Scale bar 200 μm .

Tuscan Nappe
Calcari e Marne a Rhaetavicula contorta (RET)
Upper Triassic (RHAETIAN)

Dark grey limestone and marl whit "Rhaetavicula contorta"

Outcrop located on the eastern slope of Mt. Bruceto along the dirt road "Via del Casone".



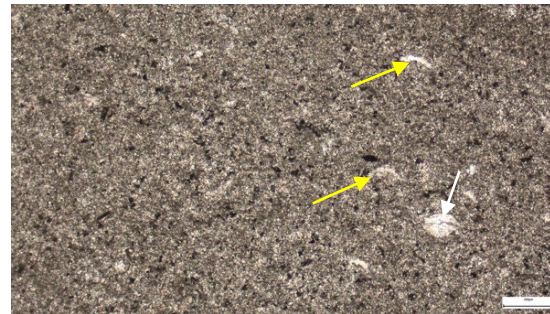
Fine-grained grey limestone. Sedimentary bedding consists of centimetre (2 -10 cm) thick limestone and discontinuous millimetre thick yellowish altered marly levels.

MOS 2A

43°47'42.60"N, 10°24'10.80" E



Massive limestone with the characteristic dark grey colour on the fresh surface.



Wackestone (fossiliferous micrite) with fossil remains, such as foraminifera tests (white arrow) and fragments of bivalve shells (yellow arrow). Scale bar 200 μ m.

Tuscan Nappe
Calcari e Marne a Rhaetavicula contorta (RET)
Upper Triassic (RHAETIAN)
Dark grey limestone and marl with “Rhaetavicula contorta”

Outcrop located at north of Avane village along the road to Filettolo, at the base of Mt. Bruceto eastern slope.



Well-exposed outcrop of grey limestone with rare marls intercalation. Decimetre-thick north dipping sedimentary bedding is cross-cut by yellowish-reddish altered calcite veins.

MOS 2B

43°47'46.10" N, 10°24'13.59"E



Dark grey limestone with thin brownish marl layers.



Wackestone with lamination due to “*Avicula contorta*” Auct. filaments (yellow arrow), bioclastic debris and organic matter.
Scale bar 200 µm.

Tuscan Nappe

Calcari e Marne a Rhaetavicula contorta (RET)

Upper Triassic (RHAETIAN)

Poorly stratified dark grey limestone with reticulate of white or yellowish-reddish calcite veins

Outcrop located at Avane.



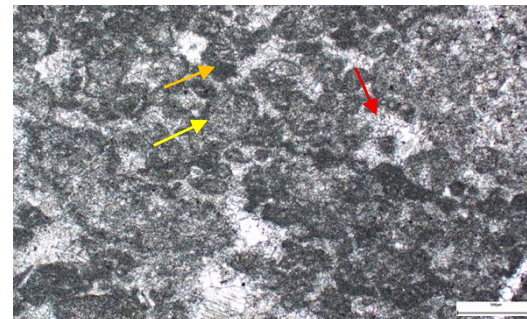
Massive dark grey limestone with poorly developed sedimentary bedding.

MOS 2C

43°47'46.10" N, 10°24'13.59"E



Fine-grained massive dark-grey limestone with yellowish-reddish alteration surfaces and millimetre white calcite grains.



Packstone with sparite matrix (red arrow), dark rounded to subrounded micrite nodules (yellow arrow) and sparse fossil fragments (orange arrow).

Scale bar 500 μ m.

Tuscan Nappe
Calcare Massiccio (MAS)
LOWER JURASSIC (HETTANGIAN – SINEMURIAN P.P.)
Massive white and light grey limestone

Outcrop located in a small abandoned quarry at north of Mt. Bruceto.



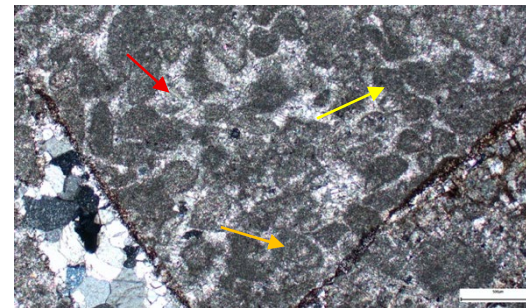
Massive to poorly stratified light grey limestone on the eastern side of quarry characterized by load casts (yellow arrow) on the sedimentary bedding.

MOS 3A

43°48'09.61" N, 10°23'22.27"E



Fine-grained grey limestone characterized by very thin calcite veins network, reddish alteration surface on the bedding and Fe-oxides grains.



Packstone with sparite matrix (red arrow), dark rounded to subrounded micrite nodules (yellow arrow) and foraminifera tests (orange arrow). Thick calcite veins. Scale bar 500 µm.

Tuscan Nappe
Calcare Massiccio (MAS)
LOWER JURASSIC (HETTANGIAN – SINEMURIAN P.P.)
Massive white and light grey limestone

Outcrop located at “Sassi Grossi” hill, along the “Via di Radicata” road.



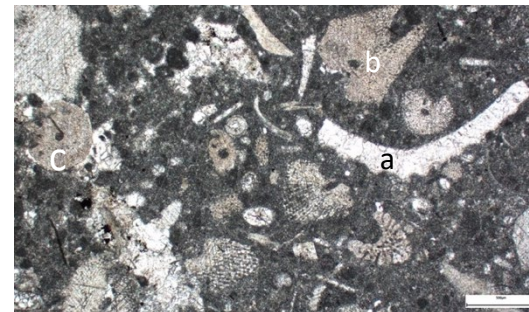
Fine-grained grey limestone with east-dipping sedimentary bedding.

MOS 3B

43°48'31,00" N, 10°23'21,00"E



Massive fine-grained limestone with diffuse thin grey calcite veins. On the fresh surface reddish calcite veins can be observed.



Packstone (packed biomicrite) with abundant fossil fragments such as bivalve shells (a), corals (b) and echinoderms (c). Scale bar 500 µm.

Tuscan Nappe
Rosso Ammonitico (RSA)
LOWER JURASSIC (SINEMURIAN P.P. – PLIENSBACHIAN P.P.)
Red and pink limestone with "Arietites"

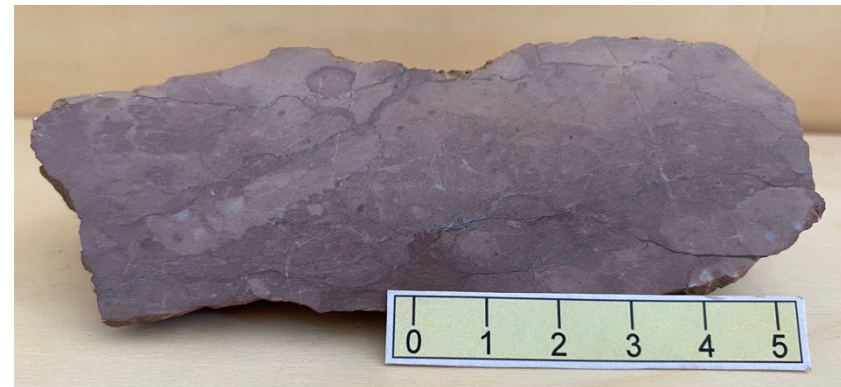
Outcrop located in a small abandoned quarry at north of Mt. Bruceto.



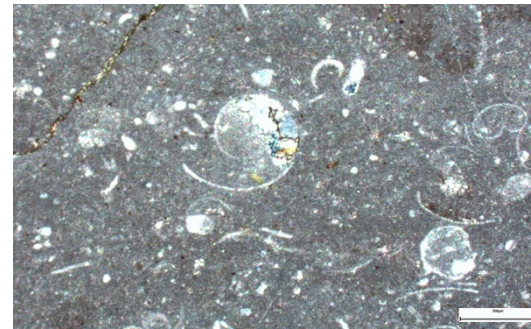
Nodular limestone with vertical bedding marked by reddish and yellowish layers (a). Detail of nodular texture that consist of carbonate and fossil clasts in a red matrix (b).

MOS 4A

43°48'10.10" N, 10°23'22.04"E



Limestone with nodular texture characterized by centimetre-sized clear nodules in fine dark red matrix.



Bioclastic wackestone with juvenile ammonite (center of photo) and bivalve shells fragments in a very-fine grained micrite matrix. Scale bar 500 μm .

Tuscan Nappe
Rosso Ammonitico (RSA)
LOWER JURASSIC (SINEMURIAN P.P. – PLIENSCHACHIAN P.P.)
Red and pink limestone with "Arietites"

Outcrop located at "Sassi Grossi" hill, along the "Via di Radicata" road.



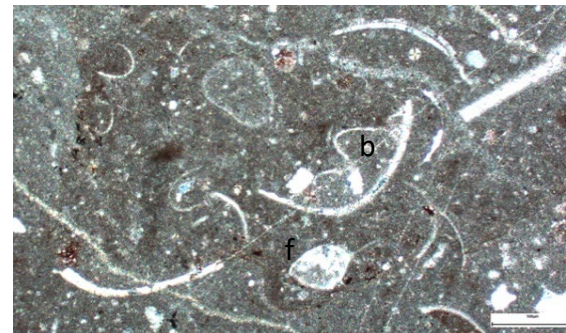
In figure (a) the stratigraphic contact between grey limestone (Calcare Massiccio Fm.) and yellowish-reddish limestone (Rosso Ammonitico Fm.). In figure (b) stratified reddish limestone at the transition between the Calcare Massiccio Fm. and the Rosso Ammonitico Fm.

MOS 4B

43°48'31,10" N, 10°23'20,72"E



Pink nodular limestone with grey colour on the altered surface.



Wackestone (matrix supported) with bioclasts such as foraminifera (f), and bivalve shells (b). Scale bar 500 μ m.

Tuscan Nappe
Calcare Selcifero di Limano (LIM)
LOWER JURASSIC (PLIENSCHACHIAN P.P. – TOARCIAN P.P.)
Grey limestone with chert lists and nodules

Outcrop located in a small abandoned quarry at north of Mt. Bruceto.



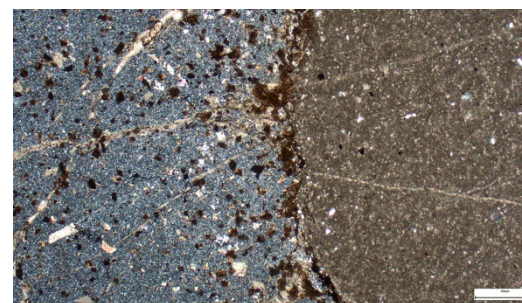
Well-stratified fine-grained grey limestone with centimetre to decimetre-thick yellowish chert layers and/or nodules. On the sedimentary bedding occurrence of oolites, oxides and manganese dendrites.

MOS 5A

43°48'09.60"N, 10°23'20.64"E



Very-fine grained limestone (calcilutite) with calcite veins and centimetre-thick (1-2 cm) chert list. A millimetre-thick calcite vein marks the contact between chert and limestone.



Mudstone (right side) with less than 10% allochems. On the left side very fine-grained silica grains (chert list). Fe oxides occur at the boundary between limestone and chert list. Scale bar 500 µm.

Tuscan Nappe
Calcare Selcifero di Limano (LIM)
LOWER JURASSIC (PLIENSBACHIAN P.P. – TOARCIAN P.P.)
Grey limestone with chert lists and nodules

Outcrop located in an abandoned quarry at the base of “Sassi Grossi” hill western slope.



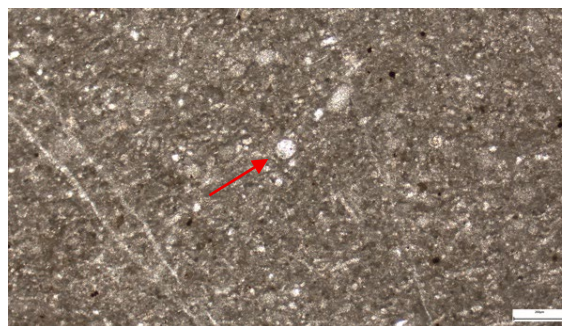
Wide exposure of well-stratified cherty limestone in an abandoned quarry. Steeply dipping sedimentary bedding consists of alternate centimetre to decimeter-thick limestone with chert layers, marly limestone and silty clays.

MOS 5B

43°48'34.00"N, 10°23'16.00"E



Fine-grained calcilutite with thin calcite veins parallel to the sedimentary bedding. A coarse-grained calcite vein occurs below the chert list.



Mudstone with calcite-casts of radiolaria (red arrow) and poorly preserved benthic fauna. Scale bar 200 μ m.

Tuscan Nappe Tectonic Unit
Calcare Selcifero di Limano (LIM)
LOWER JURASSIC (PLIENSBACHIAN P.P. – TOARCIAN P.P.)
Grey limestone with chert lists and nodules

Outcrop located in an abandoned quarry at the base of “Sassi Grossi” hill western slope.



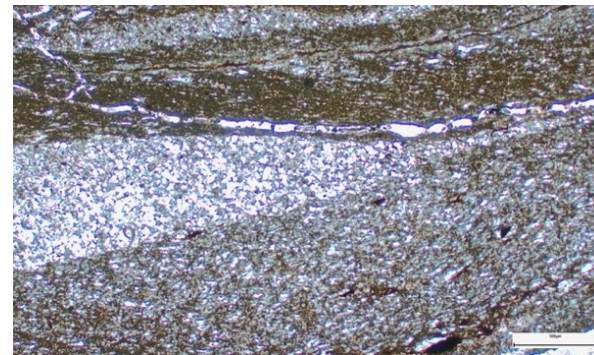
Decimetre-thick bank of cherty limestone with chert nodules (red arrow) and centimetre-thick yellowish fine laminated marly limestone level. Sedimentary bedding is crosscut by steeply dipping calcite veins (yellow arrow) and joints.

MOS 5C

43°48'34.00"N, 10°23'16.00"E



Very fine-grained laminated marly limestone with oxides and manganese dendrites on sedimentary bedding.



Very fine-grained clay-rich layers (upper side of photo) alternate with calcite-rich layers. Scale bar 500 μm.

Tuscan Nappe
Calcari e Marne a Posidonia (POD)
LOWER-MIDDLE JURASSIC (TOARCICAN P.P. – CALLOVIAN P.P.)
Marl and marly limestone with “Posidonia”

Outcrop along a dirt road on the southern slope of Mt. Bastione.



Fine-grained grey limestone (upper photo) with centimetre-thick marly limestone (ml) and thin fine laminated reddish marl level (ms).

MOS 6

43°47'57.82"N, 10°22'56.76"E



Poorly stratified laminated marly limestone.



Packstone with lamination marked by *Posidonia* filaments (red arrow) and radiolaria (yellow arrow) in a micrite matrix.
Scale bar 500 μ m.

Tuscan Nappe
Calcare Selcifero della Val di Lima (SVL)
MIDDLE-UPPER JURASSIC (CALLOVIAN P.P. – KIMMERIDGIAN P.P.)
Dark grey limestone with black chert lists

Outcrop along a dirt road on the southern slope of Mt. Bastione.



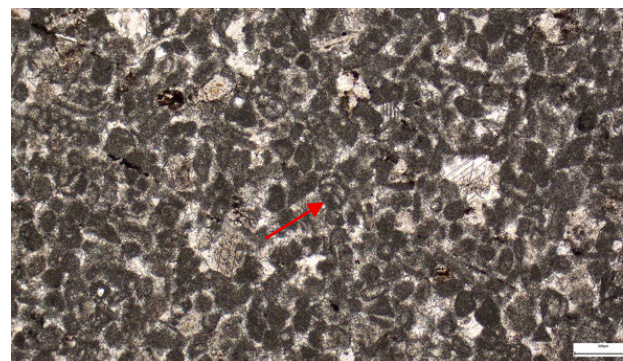
Poorly stratified grey limestone with rare chert lists close to the contact with the underlying Calcari e Marne a *Posidonia*.

MOS 7A

43°47'48.87"N, 10°22'49.85"E



Packstone made up by fine-grained peloids without internal structure. The matrix consists of sparite grains.



Packstone with rounded to subrounded resedimented micrite nodules with benthic foraminifera (red arrow). Scale bar 200 µm.

Tuscan Nappe
Calcare Selcifero della Val di Lima (SVL)
MIDDLE-UPPER JURASSIC (CALLOVIAN P.P. – KIMMERIDGIAN P.P.)
Dark grey limestone with black chert lists

Outcrop along a dirt road “Via del Roncile” on the southern slope of Mt. Bastione.



Dark grey fine-grained (calclutite) to medium-grained (calcarenite) limestone, light in color when altered, with abundant chert lists and/or nodules.

MOS 7B

43°47'41.23"N, 10°22'49.74"E



“Medium grained” dark grey limestone with thin calcite veins parallel and orthogonal to the sedimentary bedding. Light grey microcrystalline chert list (3 -4 cm) with fractures

suborthogonal to the sedimentary bedding and thin veins.



Packstone with micrite nodules and diffuse filaments constituted by thin shelled bivalve fragments.
Scale bar 500 µm.

Tuscan Nappe

Diaspri (DSD)

UPPER JURASSIC (KIMMERIDGIAN P.P. – TITHONIAN P.P.)

Reddish and greenish radiolarite "Diaspri"

Outcrop along a dirt road on the eastern slope of Mt. Legnaio.



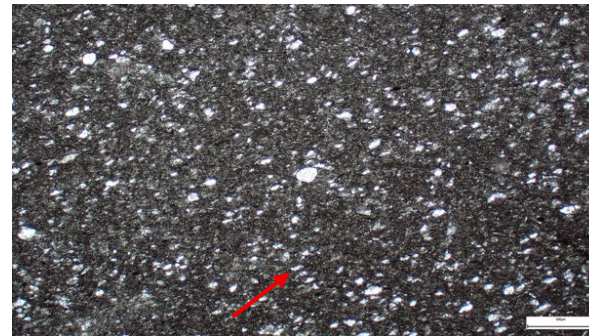
Monotonous sequence of pinkish radiolarite, light grey when altered, with very thin clay and/or marly intercalations (yellow arrow).

MOS 8

43°48'04.28" N, 10°22'44.85" E



Dark red massive radiolarite with thin calcite veins.



Siliceous packstone with lamination defined by flattened-shaped radiolaria (red arrow) and bivalve shell fragments. Scale bar 500 μm .

Tuscan Nappe
Maiolica (MAI)
LOWER CRETACEOUS (TITHONIAN P.P. - BARREMIAN)
White and grey limestone with rare chert lists

Outcrop along a dirt road on the eastern slope of Mt. Legnaio.



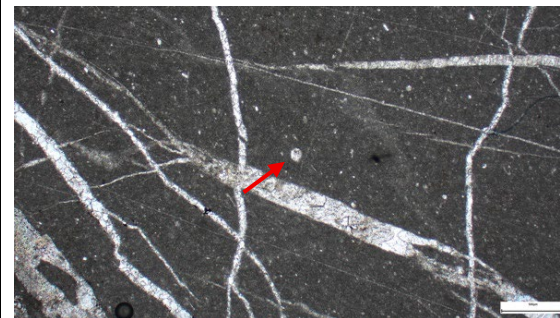
Dark grey well stratified limestone with abundant and regular chert lists that characterize the upper part of Maiolica Fm.

MOS 9B

43°48'7.78"N, 10°22'38.61"E



Grey calcilutite with dark grey chert list and irregular calcite veins. On the bedding some dark circular forms resemble crinoid articles.



Micritic wackstone with sparse radiolaria (red arrow) and diffuse calcite veins with blocky texture.
Scale bar 200 μ m.

Tuscan Nappe
Scaglia Toscana (STO)
UPPER CRETACEOUS – UPPER EOCENE (APTIAN - PRIABONIAN)
Pelitic lithofacies - varicoloured clay and marl

Outcrop located along the road “Massaciuccoli-Balbano” on the western slope of Mt. Niquila.

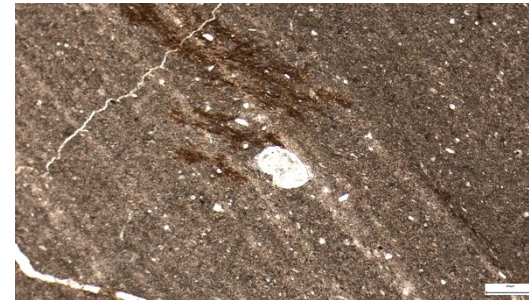


Small outcrop of greyish greenish well-stratified clay shale and marls with millimeter-thick strata close to the contact with the overlying calcarenite lithofacies.

MOS 10A
43°50'00.50"N, 10°21'55.15"E



Fine-laminated greenish grey clayey shale with red violet alteration and fracture surface orthogonal to the bedding.



Laminated clay-rich mudstone with rare bioclasts such as planktonic foraminifera tests (centre of photo). Scale bar 200 μ m.

Tuscan Nappe
Scaglia Toscana (STO)
UPPER CRETACEOUS – UPPER EOCENE (APTIAN - PRIABONIAN)
Calcarenite lithofacies

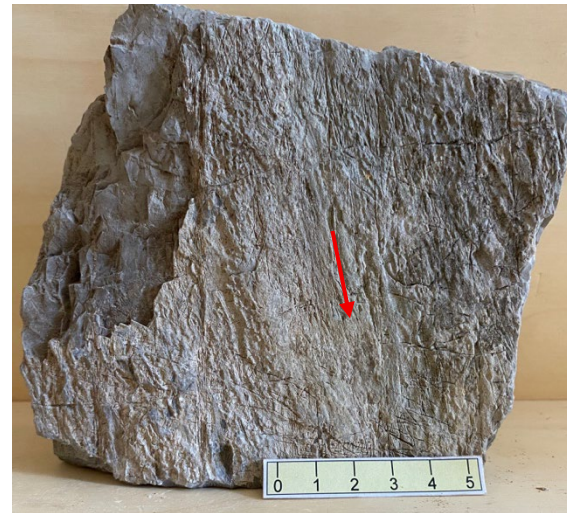
Outcrop located along the road “Massaciuccoli-Balbano”
on the western slope of Mt. Niquila.



Grey fine to medium-grained calcarenite with
centimeter to decimeter-thick strata alternate with fine-
grained calcilutites similar to the Maiolica limestone.
Locally chert lists are intercalated within the calcarenite.

MOS 10B

43°50'04.02"N, 10°21'53.85"E



Fine-grained
limestone with
“primary current
lamination” on the
sedimentary
bedding (red arrow).



Laminated
mudstone with
alternance of
dark and light
grey levels and
sparse bioclasts
Scale bar 500 μm .

Tuscan Nappe
Scaglia Toscana (STO)
UPPER CRETACEOUS – UPPER EOCENE (APTIAN - PRIABONIAN)
Calcarenite lithofacies

Outcrop located along the road “Massaciuccoli-Balbano” on the western slope of Mt. Niquila.



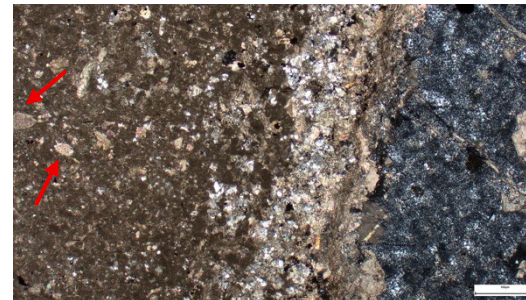
Grey fine to medium-grained calcarenite with centimetre to decimeter-thick strata alternate with fine-grained calcilutite similar to the limestone of the Maiolica Fm. Locally chert lists are intercalated within the calcarenite.

MOS 10C

43°50'04.02"N, 10°21'53.85"E



Grey calcarenitic limestone with centimetre-thick (10 – 11 cm) dark chert list.



On the left side wackstone with bioclasts (e.g. foraminifera; red arrows) and on the right side chert list. Coarse-grained calcite and Fe-oxides (centre of photo). Scale bar 500 µm.

Tuscan Nappe
Scaglia Toscana (STO)
UPPER CRETACEOUS – UPPER EOCENE (APTIAN - PRIABONIAN)
Calcarenite lithofacies

Outcrop located in an abandoned quarry at “la Casetta” locality along the road “Pietra a Padule”.



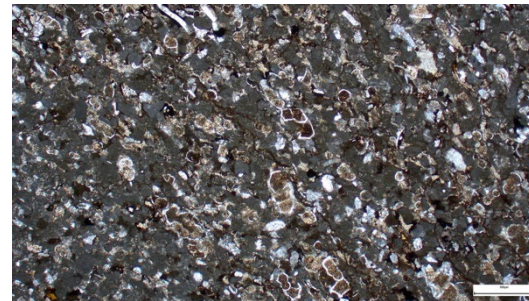
Wide outcrop of well-stratified Scaglia Toscana made up of metre to decametre-thick strata of calcarenite (upper portion of photo), alternate with varicoloured clay and marly limestone (lower right side of photo). The foliation planes in the image correspond to the sedimentary bedding.

MOS 10D

43°49'32.27"N, 10°22'2.88"E



Fine-grained marly limestone with manganiferous dendrites on the sedimentary bedding (in the foreground).



Biomicritic packstone with abundant planktonic foraminifera tests (globigerinids and globotruncanids). Scale bar 500 μm .

**Tuscan Nappe
Macigno_(MAC)**

UPPER OLIGOCENE – LOWER MIOCENE (CHATTIAN - AQUITANIAN P.P.)

Sandstone with intercalations of silty marl

Outcrop located in a small abandoned quarry.



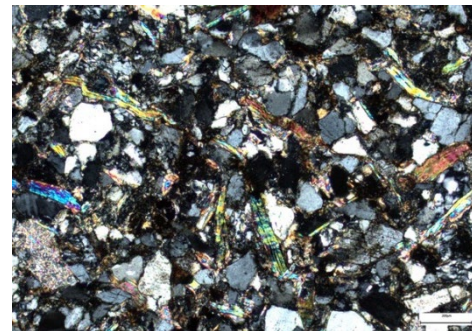
Outcrop of medium-coarse-grained turbiditic sandstone, in thick beds with intercalations of dark mudstone.

MOS 11

43°49'34.11"N, 10°24'28.03"E



Grain supported lithic arenite with quartz-feldspar grains and abundant white mica clastic grains.



Lithic arkose with angular to sub-angular poorly sorted quartz, feldspar and white mica clasts.
Scale bar 200 μ m.