Crema Capri

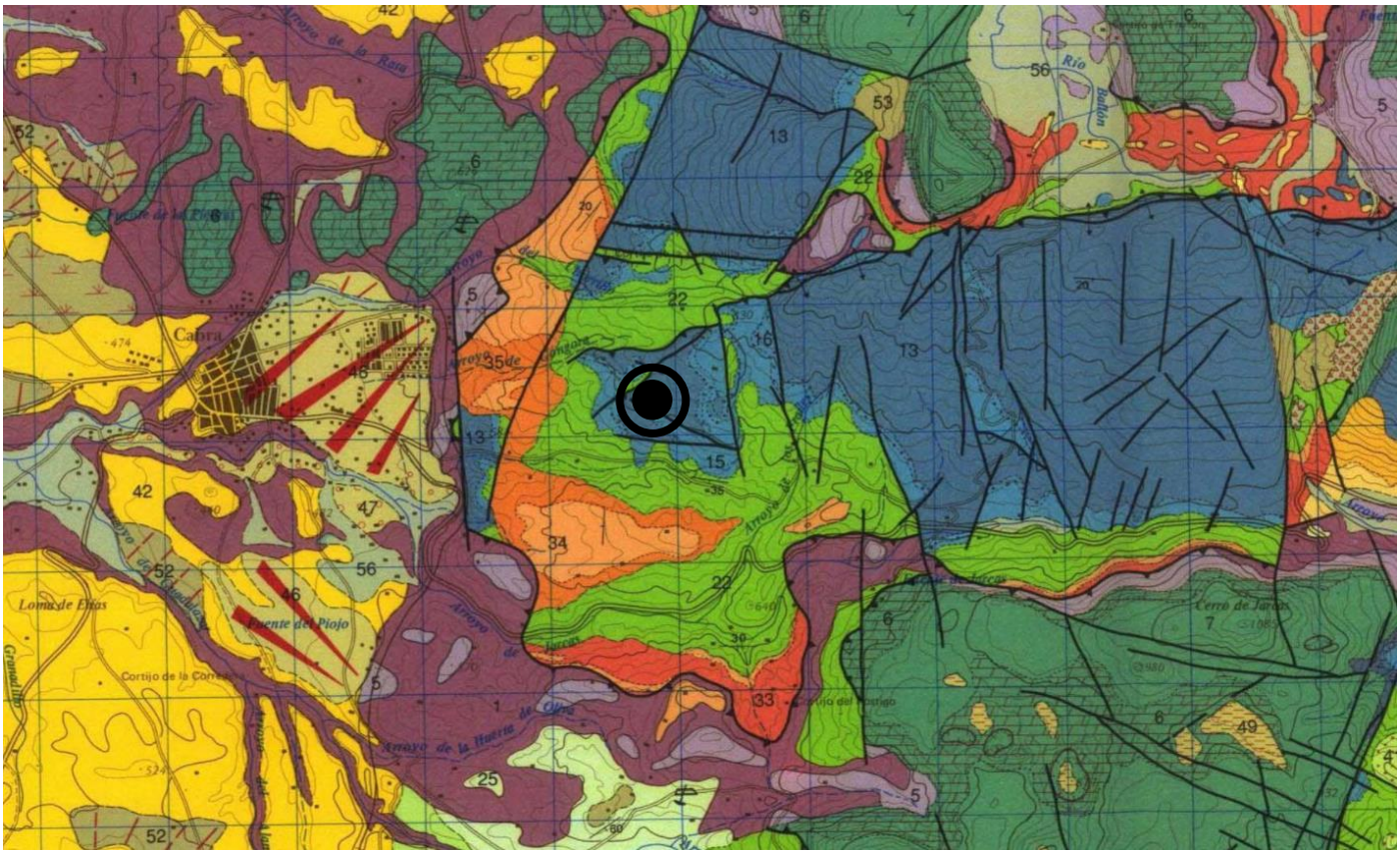
4 cm

Image source: www.itrisa.com

Short description:
White oolitic limestone with variable amounts of oncolite and/or crinoid fragments. Rock shows homogeneous appearance.

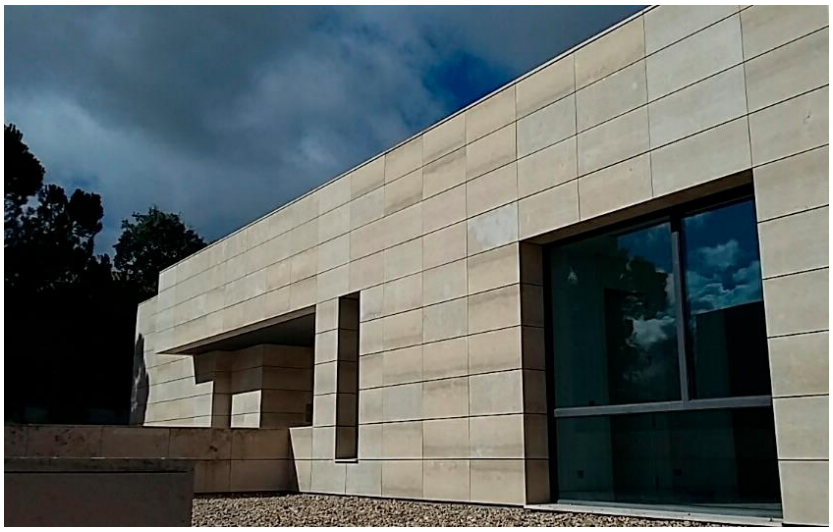
Commodity (vocabulary)	Lithology (vocabulary)	Typical colour (code list)	Place of origin			
			Country	County / District / Province	Municipality / Community	Place/town / Village
Limestone	Oolithic limstone	white	Spain	Córdoba	Cabra	Cabra

Geological setting



Geology: Crema Capri quarries are located in the Subbetic Domain of the Betic Mountain Range. The Jurassic materials in this area are characterized by carbonate materials deposited in a shallow marine environment. In these materials, three geological formations are differentiated: Gavilán Fm., Zegrí Fm., Camarera Fm., Ammonitico Rosso Superior Fm., Carretero Fm. and Quintar-Jonquera Fm. The Crema Capri belongs to the Camarera Formation. This formation is represented by oolitic limestone from the Bathonian. Rich levels of oncoliths and crinoids (grainstones) are recognized. Towards the upper part of the limestone hardgrounds appear covered by iron oxides and the development of dikes.
Geological age: Jurassic (Bathonian)
Geological unit: Camarera Formation

Application, use and heritage



Modern building. Image Source: www.cupastone.es

Outdoor paving. Image source: levantina.com

Description

There is some uncertainty about the origin of the quarries in this region and the use of the different limestones quarried here. Different authors point to a Roman origin (1st century BC) and an exploitation associated with the ancient Roman city of Igabrum (current city of Cabra, Córdoba). This limestone must have been used in local areas by means of small sculptures as well as shafts and cladding plates and epigraphic supports.
Currently, the activity in these quarries is continuous and Crema Capri is frequently used in modern works, especially as outdoor cladding and paving.

Source of information:
Ontiveros-Ortega, E., Beltrán-Fortes, J., Loza Azuaga, L., Taylor, R., Rodríguez, O. (2013): Caracterización Petrográfica de Canteras de Roca Ornamental de Época Romana de Cabra (Córdoba, España). Macla, 17: 81-82 (in Spanish).

Petrography

Description:

White oolitic limestone with variable amounts of oncolite and/or crinoid fragments. Rock shows homogeneous appearance.
At a microscopic scale, this rock corresponds to a biosparite limestone with grain supported structure and calcite mosaic cements.

Petrographic images in:
Ontiveros-Ortega, E., Beltrán-Fortes, J., Loza Azuaga, L., Taylor, R., Rodríguez, O. (2013): Caracterización Petrográfica de Canteras de Roca Ornamental de Época Romana de Cabra (Córdoba, España). Macla, 17: 81-82 (in Spanish).

Source of information:

1) Spanish Geological Survey (IGME)
2) Ontiveros-Ortega, E., Beltrán-Fortes, J., Loza Azuaga, L., Taylor, R., Rodríguez, O. (2013): Caracterización Petrográfica de Canteras de Roca Ornamental de Época Romana de Cabra (Córdoba, España). Macla, 17: 81-82 (in Spanish).

Mineral composition

If no accurate number, use MM=main minerals, SM = Subordinate minerals, AM=accessory minerals

Mineral 1 (%)	Mineral 2 (%)					
Calcite (>99%)	**Gypsum (AM)**					

Source of information:

1) Ontiveros-Ortega, E., Beltrán-Fortes, J., Loza Azuaga, L., Taylor, R., Rodríguez, O. (2013): Caracterización Petrográfica de Canteras de Roca Ornamental de Época Romana de Cabra (Córdoba, España). Macla, 17: 81-82 (in Spanish).
2) Spanish Geological Survey (IGME)

Physical properties

Apparent density (EN 1936) kg/m3	Open porosity (EN 1936) % vol	Water absorption at atmospheric pressure (EN 13755) % wt	Uniaxial Compressive strength (EN 1926) MPa	Flexural strength under concentrated load (EN 12372) MPa
2620	**7.62**	**3.13**	**67.38**	**23.44**

Real density (EN 1936) kg/m3	Total porosity (EN 1936) % vol	Water absorption coefficient by capillary (EN 1925) (g/m2 x s0,5)	Flexural strength under constant moment (EN 13161) MPa

Frost resistance (EN 12371)				
Technological Test (Test A)				Identification Test (Test B): Number of cycles completed prior to stone failure
Flexural strength (EN 12372) after freeze-thaw cycling, MPa	Number of cycles	Uniaxial compressive strength (EN 1926) after freeze-thaw cycling, MPa	Number of cycles	
21.09	**56**	**62.13**	**56**	

Resistance to ageing by thermal shock (EN 14066)			
Change in dynamic modulus of elasticity (increase: +; decrease: -) %	Change in open porosity (increase: +; decrease: -) %	Change in ultrasound pulse velocity (increase: +; decrease: -) %	Change in flexural strength under conc. load (increase: +; decrease: -) %
-0.2			**0**

Abrasion resistance (EN 14157)			Resistance to salt crystallisation (EN 12370)	Breaking load at dowel hole (EN 13364)	
Method A - Wide Wheel Abrasion Test, mm	Method B - Böhme Abrasion Test, cm^3 / $50cm^2$	Method C - Amsler Abrasion Test, mm	Change in mass (increase: +; decrease: -), %	Breaking load, N	Thickness of the test specimens, mm
22			**-9.1**	**2000**	

Slip resistance by means of the pendulum tester (EN 14231 / CEN/TS 16165)			Rupture energy (EN 14158), Joule	Thermal Conductivity (EN 1745), W/m·K
Tested surface finish	Slip Resistance Value — SRV			
	Dry test condition	Wet test condition		
polished	**53**	**10**	**2**	

Source of information:
Levantina, the natural stone company. Technical File of Caliza Capri.
https://www.levantina.com/wp-content/uploads/2016/05/14-Caliza-Capri-Ficha-1.pdf

Chemical properties

Main elements

SiO_2 (%)	Al_2O_3 (%)	Fe_2O_3 (%)	TiO_2 (%)	MgO (%)	CaO (%)	Na_2O (%)	K_2O (%)	MnO (%)	P_2O_5 (%)	SO_3 (%)	LOI (%)
				0.29	55.45	0.04					43.42

Trace elements

V (ppm)	Cr (ppm)	Mn (ppm)	Co (ppm)	Ni (ppm)	Cu (ppm)	Zn (ppm)	As (ppm)
Sr (ppm)	Cd (ppm)	Ba (ppm)	Pb (ppm)	Be (ppm)	Rb (ppm)	Bi (ppm)	U (ppm)
Sc (ppm)	Y (ppm)	Th (ppm)	Sb (ppm)	Ta (ppm)	Nb (ppm)	Zr (ppm)	Sn (ppm)
Ag (ppm)	B (ppm)	Mo (ppm)	W (ppm)	Ga (ppm)	Ge (ppm)	Se (ppm)	Cs (ppm)
Tl (ppm)							

REE

La (ppm)	Ce (ppm)	Pr (ppm)	Nd (ppm)	Sm (ppm)	Eu (ppm)	Gd (ppm)	Tb (ppm)
Dy (ppm)	Ho (ppm)	Er (ppm)	Tm (ppm)	Yb (ppm)	Lu (ppm)		

Methods applied and source of information:

Cárdenes Van den Eynde, V., Mateos, F.J., Paradelo, R. (2013): Degradability of building Stone: influence of the porous network on the rate of dissolution of carbonate and eaporitic rokcs. Journal of cultural Heritage, 14: 89-96.

Sources of more information

Type of information	Name of provider	URL
This data sheet	Levantina, the natural stone company.	https://www.levantina.com/wp-content/uploads/2016/05/14-Caliza-Capri-Ficha-1.pdf
Non-commercial directory	Spanish Geological Survey	www.igme.es
Commercial directory	RockMaquina – Piedras naturales, maquinaria y equipos.	
Scientific publication	Cárdenes Van den Eynde, V., Mateos, F.J., Paradelo, R. (2013): Degradability of building Stone: influence of the porous network on the rate of dissolution of carbonate and eaporitic rokcs. Journal of cultural Heritage, 14: 89-96. Ontiveros-Ortega, E., Beltrán-Fortes, J., Loza Azuaga, L., Taylor, R., Rodríguez, O. (2013): Caracterización Petrográfica de Canteras de Roca Ornamental de Época Romana de Cabra (Córdoba, España). Macla, 17: 81-82 (in Spanish).	
Other publication		

Compiled by:	Instituto Geológico y Minero de España (IGME) http://www.igme.es/	Instituto Geológico y Minero de España