Supplementary Table. Mineralogical results.

Cave	Location	Sample description	Sample no.	Ardealite	Brushite	Monetite	Hydroxylapatite	Fluorapatite	Crandallite	Montgomeryite	Variscite	Taranakite	Sphenisciditе	Leucophosphite	Newberyite	Berlinite (?)	Vashegyite	Strengite	Vivianite	Whitlockite	Robertsite	Gypsum
Domica (Sk.)	Prales Chamber	Weathered limestone below guano	Pr. A	x	x		x															
		White paste below guano	Pr. B	x	x							x										x
Baradla (H.)	Teknösbéka (Turtle Gallery)	Brown crust of bat urine in cupola	BA 3				x															
	Libanon hegye	Yellow layer	BA 4a		x			x														
		White laminated layer at the bottom	BA 4b									x	x									
		Black layer at the bottom	BA 4c									x										
		White paste at limestone contact	BA 4d																			x
Julio (Fr.)	Upper chamber, light silts below phosphate crust	White silt	Vezelle 2															x				
		Grey silt	Vezelle 3										x									
Isturitz-Oxocelhaya (Fr.)	Staircase	Sandy layer					x															
	Rhinolophes Chamber	White crust					x															x
	Lithophone	Rimstone with fresh guano					x															
	Great Pilar	Dark surfaces					x															
Raganeous (Fr.)	Top of shaft	Yellow-orange crust on surface	RA 1162																			x
	Guano hill (base of shaft)	Base close to rock contact, white layer	Raga Base blanc	x	x		x															x
		Base close to rock contact, brown layer	Raga Base brun RBB	x	x		x															x
		Top, white layer	Raga top blanc	x	x																	
		Top, brown layer	Raga top brun	x	x		x															
Guano (Fr.)	Chamber 100 m	Crust between guano	Gua 1b				x		x													

Supplementary Table. Mineralogical results.

	from entrance	and clay																				
		Weathered paste on carbonate rock surface	Gua 2				x												?	x		
Saint-Marcel (Fr.)	Galerie des Chauves-souris	Yellow crystals on top of guano	SM 2b																			x
Grosse Marguerite (Fr.)	Almost top of cave	Thick pure white level at 15 cm depth	GM2																			x
Mescla (Fr.)	Sump 1	White paste filling underwater fissures	Mescla 1					?														
		Black crust on the underwater walls	Mescla 2				?	x														
Aramiska Peštera (Rep. Maced.)								x														
Karši Podot Cave (Rep. Maced.)	Main chamber	Dark layer in sand deposits covered with thick guano	KP06					x														
Cave Lekovita Voda (Rep. Maced.)	Niche on the wall	Yellow clay deposits close to guano veneer	LEK1					x														
Eremita (It.)	Room between P23 and P703-4	B&W laminated stalactite	ER1ab				x															
	Chamber bottom P19	White crust (a) with olive green color (b)	ERE 3ab				x															
		Black crust close to guano	ERE 4				x															
		Beige crust	ERE 5				x															
		Yellow-green crust on breccia	ERE 6				x															
		White corroded stalactite	ERE 7				x															
		White-yellowish earthy material	ERE 8				x															
		White paste	ERE 9				x															
		Green “sand” (a) and white earthy (b)	ERE 10ab				x															
	Top of P19	White needles	ERE 11																			x
		Green powder	ERE 12				x															
	Top of P17	White crust	ERE 13				x															
	Ramo dei Cinque	Transparent microcrystal of micaceous aspect	ERE 14																			x
		Light beige powder	ERE 15									x										

Supplementary Table. Mineralogical results.

		White pink earthy	ERE 16									x										
		White layer	Eremita3								x											x
		Bright yellow layer	Eremita4									x										x
Cocci (It.)	Galleria Cristina	Transparent crystals	COC 1																			x
		Crystal crust	COC 3																			x
		White-yellow powder	COC 4				x															
		White-brown crust	COC 5				x															
		Yellow crust	COC 7				x															
		White-grey crust	COC 9				x															x
		Stalactite light beige-greenish earthy	COC 9bc				x															
		Beige crust	COC 10				x															
		White earthy grains	COC 11a				x															
		Light greenish spherules	COC 11b1						x													
		Light pinkish aggregates	COC 11b2				x?		x	x												
		Transparent crystals	COC 13																			x
Fitusa (It.)	Entrance chamber	Dark crust	FIT 3				x															
Palombara (It.)	After climb	Violet crust	PA 23				x														x	
	5 m before sala del Guano	Bright pink mineral	P5a								x											
		Pure white mineral	P5b									x										
Monello (It.)	End of lower gallery	Thin brown crust on weathered limestone	MO 4				x															
Scrivilleri (It.)	Bottom of chamber after Prima Fissura	Dark crust	SC4					x														
Personaggi (It.)	Radici Gallery	Black crust in cupola	PG1				x	?														
	Ammoniti Gal., confluence with Mud gallery	White part of a mass on a block	PG3				x	?														
	Ammoniti Gal., confluence with Mud gallery	Blackish part in same mass as PG 3	PG4				x															
	Mud gallery above station 1.180	Blackish paste between white and reddish parts	PG7				x															
	Bats gallery	Whitish paste at the bottom of gallery	PG15				x															
	Bats gallery	White, black, and yellow crust attached to guano	PG18				x															

Supplementary Table. Mineralogical results.

	Bats gallery	White, black, yellow crust in guano pot	PG19				x															
	Lost shaft	Black crust on wall	PG31				x	?														
	NW Gallery, above traverse	Multicolor crust, green, white	P3				x	?														
Salnitro (It.)	Final chamber	Dry aureole around wet fresh guano	SN 3	x	x																	
	Close station 1.4	Black-brown crust on the wall	SAL 1				x															
	Left gallery, before climb	Brown crust on the wall	SAL 2				x															
	Left Chamber	Transparent mat	SAL 3				x															
	Climb left chamber	Black crust with guano	SAL 4				x															x
Carburangeli Cave (It.)	Inner part of the cave	Green clays below stalagmites and flowstones	CA 1						x													
	Inner part of the cave	Brownish veins on the roof	CA 2				x															
	Inner part of the cave	Brownish crusts on the roof	CA 3				x															
Pertosa-Auletta Cave (It.)	Fossil passage close to station 1	Dark brown crusts along walls and cupolas las	P1				x					x										
			P2				x															
			P3				x															
	Along underground river, close to station 10	Thick deposit with alternation of brown and more yellowish layers	P4				x	?				x										
Colombo (Toirano) (It.)	Large room 50 m from entrance	Hard yellow crust on old guano heap	C1												x							x
		Yellow material on guano	C3	x	x																	
Corona ’e sa Craba (It.)	Walls of main chamber	Colored crusts in different places	CC12										x	x								
			CC13															x				
			CC18				x															
			CC20									x										
			CC36										x								x	
			CC45														x					
			1904													?						