

[Supplementary material]

Birds and bovids: new parietal engravings at the Romanelli Cave, Apulia

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Table S1. Chronology of the deposits (new dates are marked in grey). Ages are calibrated with the OxCal v.4.4 (Bronk Ramsey 2017) using both the IntCal13 and IntCal20 curves (Reimer *et al.* 2013, 2020). The collagen was extracted from bone fragments or from crushed bones (samples labelled with P).

Sample	Romanelli cave (Blanc's stratigraphy)	US	Square	Sample	Lab. code	Radiocarbon age	14C cal yr BP (2 σ) IntCal13	14C cal yr BP (2 σ) IntCal20	References
-	Lay. A	-	-	Charcoal	GrN-2056	9880 \pm 100	11 752–11 131	11 745–11 141	(Vogel & Waterbolk 1963)
-	Lay. A	-	-	Charcoal	GrN-2305	10 320 \pm 130	12 567–11 620	12 623–11 689	(Vogel & Waterbolk 1963)
-	Lay. A	-	-	Humic acid	R-54	9050 \pm 100	10 503–9898	10 502–9894	(Alessio <i>et al.</i> 1965)
-	Lay. A	-	-	Charcoal	R-58	11 800 \pm 600	15 783–12 646	15 800–12 681	(Alessio <i>et al.</i> 1964)
-	Lay. B	-	-	Humic acid	R-56	11 960 \pm 320	15 038–13 211	15 024–13 237	(reported in Alessio <i>et al.</i> 1964)
-	Lay. B	-	-	Humic acid	R-56	11 930 \pm 520	15 580–12 810	15 595–12 846	(Bella <i>et al.</i> 1958)
GR2016-206	Lay. B	981	O84	Bone	LTL17293 A	8048 \pm 75	9135–8639	9135–8639	(Calcagnile <i>et al.</i> 2019)
GR2016-162	Lay. B	2	H95	Bone	LTL 17303A	8397 \pm 45	9503–9274	9499–9393	(Calcagnile <i>et al.</i> 2019)
RR529	Lay. B-C	4001	AB88	Bone	SacA 61166	9925 \pm 45	11 412–11 232 (83.2%)	11 408–11 234 (79.8%)	This work
RR529P	Lay. B-C	4001	AB88	Bone	SacA 61170	9955 \pm 45	11 506–11 246 (79.3%)	11 509–11 245 (79.1%)	This work
-	Lay. C	-	-	Charcoal	GrN-2153	10 390 \pm 80	12 542–11 998	12 497–11 941	(Vogel & Waterbolk 1963)
-	Lay. C	-	-	Charcoal	GrN-2154	9790 \pm 80	11 404–11 067	11 402–11 067	(Vogel & Waterbolk 1963)
GR17-464	Lay. C	1	I89	Bone	LTL 17741A	9657 \pm 65	11 205–10 775	11 207–10 993 (51%) 10 977–10 770 (44.5%)	(Calcagnile <i>et al.</i> 2019)
GR2016-154	Lay. C	988	P84	Bone	LTL 17295A	9774 \pm 40	11 250–11 152	11 622–11 261	(Calcagnile <i>et al.</i> 2019)
GR2016-158	Lay. C	983	P84	Bone	LTL 17299A	9822 \pm 45	11 311–11 181	11 319–11 188	(Calcagnile <i>et al.</i> 2019)

GR2016-105	Lay. C	995	O84	Bone	LTL 17292A	11 328±60	13 289–13 075	13 282–13 110	(Calcagnile <i>et al.</i> 2019)
RR9	Lay. C	998	P84	Tooth	SacA 61166	10 880±50	12 836–12 691	12 895–12 736	This work
GR2016-159	Lay. C	998	P84	Bone	LTL 17300A	10 100±80	12 015–11 335	11 940–11 388	(Calcagnile <i>et al.</i> 2019)
GR2016-157	Lay. C	998	M88	Bone	LTL 17298A	10 277±45	12 189–11 822	12 192–11 822 (81.9%)	(Calcagnile <i>et al.</i> 2019)
GR2016-465	Lay. C	14	I89	Bone	LTL 17740A	10 295±75	12 404–11 802	12 471–11 820	(Calcagnile <i>et al.</i> 2019)
-	Lay. D	-	-	Charcoal	GrN-2055	10 640±100	12 743–12 241	12 770–12 451	(Vogel & Waterbolk 1963)
GR2016-153	Lay. D	ND	H95	Bone	LTL 17294A	10 990±50	12 996–12 729	13 071–12 816 (89.2%)	(Calcagnile <i>et al.</i> 2019)
GR2016-616	Lay. D	1003	U89	Bone	LTL 17738A	11 858±85	13 853–13 469	13 870–13 575 (81.7%)	(Calcagnile <i>et al.</i> 2019)
GR2016-622	Lay. D	1004	U89	Bone	LTL 17737A	11 409±85	13 422–13 092	13 457–13 159	(Calcagnile <i>et al.</i> 2019)
GR2016-581	Lay. D	1005	U90	Bone	LTL 17736A	11 685±65	13 645–13 387	13 666–13 413 (88.1%)	(Calcagnile <i>et al.</i> 2019)
GR2016-156	Lay. D	1005	Q84	Bone	LTL 17297A	11 829±80	13 976–13 545	13 886–13 589 (78.8%)	(Calcagnile <i>et al.</i> 2019)
GR-522	Lay. D	1005	U90	Bone	SacA 61167	10 730±45	12 734–12 594	12 757–12 677	This work
GR-522P	Lay. D	1005	U90	Bone	SacA 61169	10 455±45	12 546–12 135	12 402–12 166 (43.9%)	This work
GR2016-779	Lay. E	1008	U89	Bone	SacA 61171	11 440±50	13 408–13 153	12 618–12 521 (29.2%)	This work
GR2016-779P	Lay. E	1008	U89	Bone	SacA 61168	11 120±45	13 087–12 839	13 442–13 227 (88.2%)	This work
-	Lay. F	-	-	Stalagmite	-	40 000±3250	... –40 755	-	(Fornaca-Rinaldi & Radmilli 1968)
-	Lay. H	-	-	Stalagmite	-	<69 000	-	-	(Fornaca-Rinaldi & Radmilli 1968)

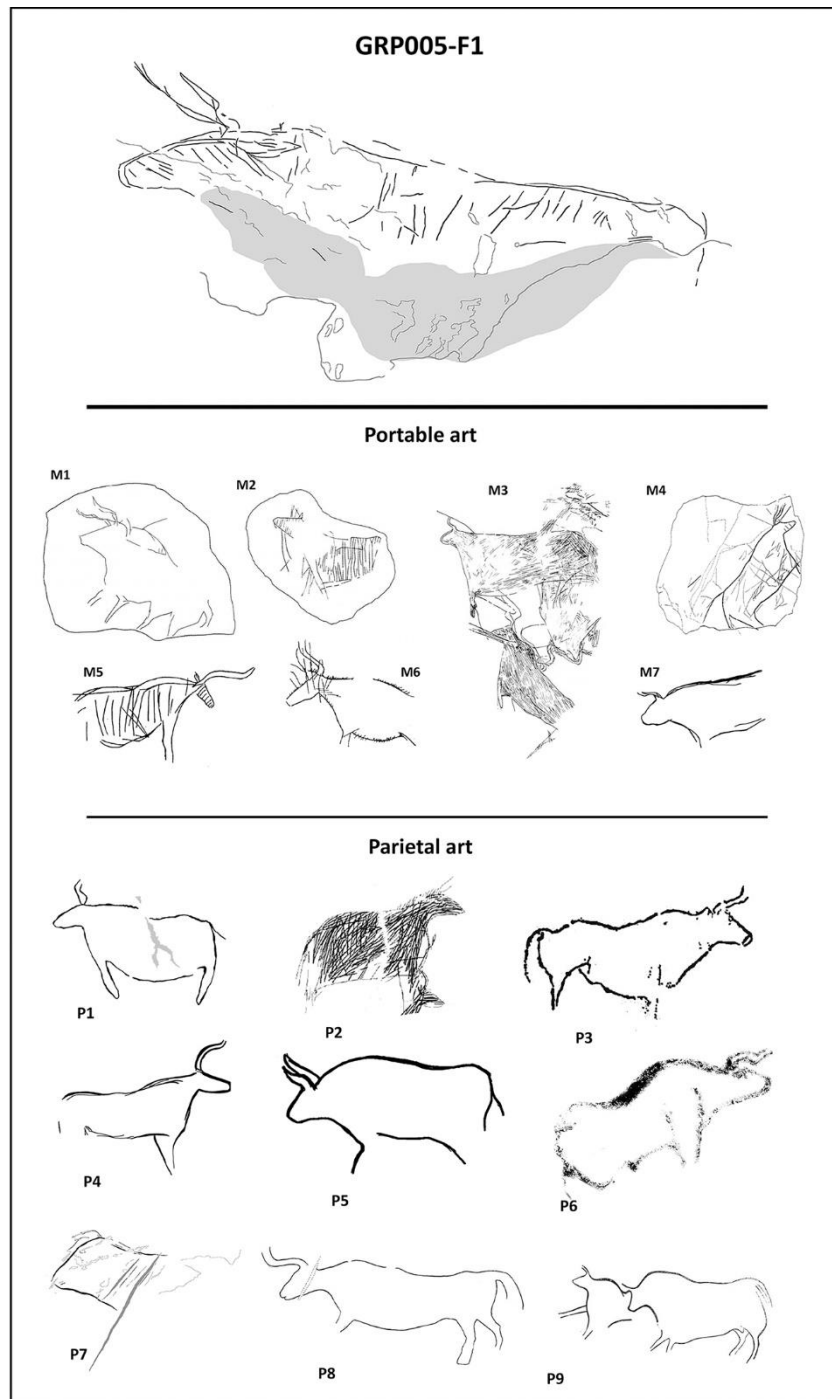


Figure S1. The bovid, GRP005-F1, compared with portable art: Romanelli (M1–2) (Acanfora 1967); Cavallo (M3) and Levanzo (M4) (Graziosi 1973); Parpallò (M5–6) (Villaverde 1994); Mas D’Azil (M7) (digital tracing by D. Sigari); parietal art: Gobustan (P1) (Sigari 2009); Foz Côa (P2) (Zilhão 1997); Siega Verde (P3) (Alcolea & de Balbín 2006); Ebbou (P4), Laugerie Haute (P5), El Castillo (P6) (digital tracing by D. Sigari), Romito (P7) (Sigari 2020); and Levanzo (P8) and Niscemi (P9) Caves (Graziosi 1973).

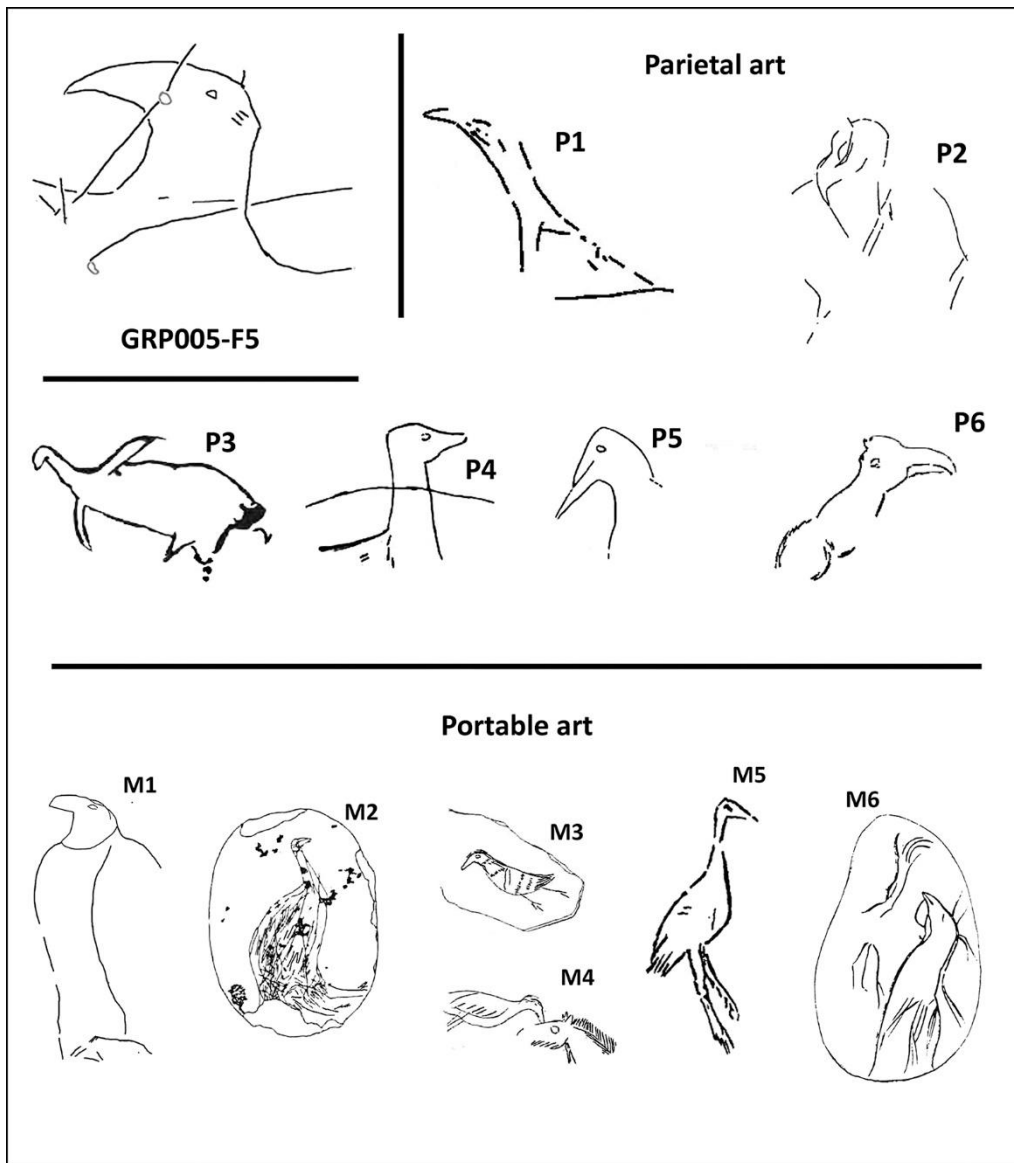


Figure S2. The bird, GRP005-F5, compared with parietal art: El Pendo (P1) (Jiménez-Guijarro et al. 2011); Fornols-Haut (P2), Cosquer (P3), Labastide (P4), Pestillac (P5) and Trois-Frères (P6) (Nicolau-Guillaumet 2008); portable art: Paglicci (M1) (Palma di Cesnola 2003); Gourdan (M2) and Espéluques (M3–4) (Nicolau-Guillaumet 2008); Laugerie-Basse (M5–6) (Crémadès et al. 1997; Tosello 2003)

References

- ACANFORA, M.O. 1967. Figurazioni inedite della Grotta Romanelli. *Bullettino di Paletnologia Italiana* 18: 7–67.
- ALCOLEA, J. J. & R. DE BALBÍN. 2006. *Arte Paleolítico al aire libre: el yacimiento rupestre de Siega Verde, Salamanca*. Salamanca: Junta de Castilla y León.
- ALESSIO, M., F. BELLA. & C. CORTESI. 1964. University of Rome carbon-14 dates II.

Radiocarbon 6: 77–90. doi:10.1017/S0033822200010559

ALESSIO, M., F. BELLA., F. BACHECHI. & C. CORTESI. 1965. University of Rome carbon-14 dates II. *Radiocarbon* 7: 213–22. doi:10.1017/S0033822200037218

BELLA, F., A.C. BLANC., G.A. BLANC. & C. CORTESI. 1958. Una prima datazione con il carbonio 14 della formazione pleistocenica di Grotta Romanelli (Terra d'Otranto).

Quaternaria 5: 87–94.

BRONK RAMSEY, C. 2017. Methods for summarizing radiocarbon datasets. *Radiocarbon* 59: 1809–33. <https://doi.org/10.1017/RDC.2017.108>

CALCAGNILE, L. *et al.* 2019. New radiocarbon dating results from the Upper Paleolithic–Mesolithic levels in Grotta Romanelli (Apulia, Southern Italy). *Radiocarbon* 61: 1211–20. <https://doi.org/10.1017/RDC.2019.8>

CRÉMADES, M., M. PELLICER CATALAN & J.L. SANCHIDRIÁN TORTI. 1997. Nouvelles figurations d'oiseaux de l'art mobilier paléolithique franco-espagnol. *Paléo* 9: 371–87. <https://doi.org/10.3406/pal.1997.1243>

FORNACA-RINALDI, G. & A.M. RADMILLI. 1968. Datazione con il metodo $^{230}\text{Th}/^{238}\text{U}$ di stalagmiti contenute in depositi musteriani. *Atti della Società Toscana di Scienze Naturali* 75: 639–46.

GRAZIOSI, P. 1973. *L'arte preistorica in Italia*. Firenze: Sansoni.

JIMÉNEZ-GUIJARRO, J., A. SÁNCHEZ-MARCO & M. GARCÍA-DÍEZ. 2011. Nuevo examen de los grabados paleolíticos de El Pendo (Cantabria, España): consideraciones sobre las aves del arte paleolítico de la Península Ibérica. *Trabajos de Prehistoria* 68: 147–58. <https://doi.org/10.3989/tp.2011.11063>

NICOLAU-GUILLAUMET, P. 2008. Avifaune et art paléolithiques: essai pour une bibliographie exhaustive. *Alauda* 76: 287–96.

PALMA DI CESNOLA, A. 2003. *Paglicci ed il Paleolitico del Gargano*. Foggia: Claudio Grenzi.

REIMER, P.J. *et al.* 2013. IntCal13 and Marine13 radiocarbon age calibration curves 0–50 000 years cal BP. *Radiocarbon* 55: 1869–87. https://doi.org/10.2458/azu_js_rc.55.16947
– 2020. The IntCal20 Northern Hemisphere radiocarbon age calibration curve (0–55 cal kBP). *Radiocarbon* 62: 725–57. <https://doi.org/10.1017/RDC.2020.41>

SIGARI, D. 2009. La roccia 44 di Böyük Daş (Gobustan, Azerbaijan): elementi per lo studio delle figure zoomorfe nell'arte rupestre all'aria aperta nell'arco alpino e in Europa. *Bullettin d'Etudes Préhistoriques et Archeologiques Alpines* 20: 151–60.

– 2020. Review of the animal figures in the Palaeolithic rock art of the Romito shelter: new

discoveries, new data and new perspectives. *Oxford Journal of Archaeology* 39: 344–67.
<https://doi.org/10.1111/ojoa.12203>

TOSELLO, G. 2003. *Pierres gravées du Périgord magdalénien: art, symboles, territoires*. Paris: CNRS.

VILLAVARDE, V. 1994. *Arte paleolítico de la Cova del Parpalló: estudio de la colección de plaquetas y cantos grabados y pintados*. Valencia: Servei D'Investigació Prehistòrica Diputació de València.

VOGEL, J.C. & H.T. WATERBOLK. 1963. Groningen radiocarbon dates IV. *Radiocarbon* 5: 163–202. <https://doi.org/10.1017/S0033822200036857>

ZILHÃO, J. (ed.) 1997. *Arte Rupestre e Pré-História do Vale do Côa. Trabalhos de 1995–1996*. Lisboa: Ministério da Cultura.