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SUPPLEMENTARY ONLINE MATERIAL FOR

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Theropod dinosaurs from the Upper Cretaceous of the South Pyrenees Basin of Spain

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Supplementary Online Material

Table 1. Measurements of theropod teeth from the South Pyrenees Basin.

Table 2. Discriminant analysis for the South Pyrenees Basin sample including *Richardoestesia*-like (Prieto-Marquez et al., 2000) and *Pyroraptor olympius* (Allain pers. communication).

Table 3. Chronostratigraphic succession of theropod taxa from the upper Cretaceous of South Pyrenees Zone.

Table 4. European theropod dinosaur record for the Campanian-upper Maastrichtian.

Table 1. Measurements of theropod teeth from the South Pyrenees Basin.

		height	fabl	width	dd/mm	dm/mm
Indeterminate theropod morphotype 1	MCNA-2205	43	19	8.9	3	3
	MCNA-14520	46	15	9	2.5	3
	MCNA-14521	62	16	8	3	0
	MCNA-1852	45	15	9	3	3
	MON-T10 1	42	15	7		2.00
	MPZ2004/3	19.5	15	9.5	2	
	MPZ2004/4	45	24	12.5	2	2
	MPZ2004/5	18				3
	MPZ2004/8	28	12	7.5	2.5	2.5
	MPZ98/67	27.5	27	13		
Indeterminate theropod morphotype 2	MCNA-1853	24	13	7.25	3	4
	MCNA-14522	20	12	6.2	3	4
	MPZ98/68	18	16		2.91	5.03
Coelurosauria indet.	DPM-VIR4-T5	2.88	1.34	0.94	0	
	DPM-MON-T3	2.75	1.6	0.72	0	
	DPM-MON-T6	3.25	1.44	1.16	0	
	MPZ98/79	1.86	1.86	1.02	0	
	MPZ98/80	2.56	1.81	0.88	0	
	MPZ98/81	1.91	1.39	0.74	0	
	MPZ98/82	2.42	1.21	0.74	0	
	MCNA-14523	2.8	3.52	1.6	0	
	MCNA-14524	2.84	2.2	1.6	0	
	MCNA-14525	1.52	1.16	0.68	0	
	MCNA-14526	3.92	4.2	1.4	0	
	MCNA-14527	1.52	1.08	0.76	0	
	MCNA-14528	4.12	2.8	1.2	0	
	MCNA-14529	4.76	2.6	1.28	0	
	MCNA-14530	4.48	1.76	1.2	0	
	MCNA-14531	3.12	2.08	1.12	0	
	MCNA-14532	2.44	1.08	0.44	0	
	MCNA-14533	1.4	0.8	0.56	0	
	MCNA-14534	1.72	1.64	0.8	0	
	MCNA-14535	1.52	0.92	0.6	0	
	MCNA-14536	2.08	0.64	0.48	0	
	MCNA-14537	1.6	1.44	0.72	0	
	MCNA-14538	2.8	1.24	0.76	0	
	MCNA-14539	2.04	1.28	0.84	0	
	MCNA-14540	1.84	1.2	0.6	0	
	MCNA-14541	2.44	1.8	0.88	0	
MCNA-14542	1.72	1.28	0.6	0		
MCNA-14543	1.44	1.24	0.52	0		

MCNA-14544	3.08	1.75	1.08	0		
MCNA-14545	8.13	4.3	2.25	0		
MCNA-14546	5.75	1.75	1.5	0		
MCNA-14547	8.125	3.375	1.88	0		
MCNA-14548	2.6	2.08	1.7	0		
MCNA-14549	2.41	1.5	1	0		
MCNA-14550	5.33	2.5	1.9	0		
MCNA-14551	5.5	1.83	1.21	0		
MCNA-14552	4.25	1.92	1.5	0		
MCNA-14553	4	1.58	1.1	0		
MCNA-14554	2.91	1.91	1.35	0		
MCNA-14555	3.5	1.91	1.2	0		
MCNA-14556	3.75	1.5	1.15	0		
MCNA-14557	3.16	1.41	0.9	0		
MCNA-14558	1.83	1.41	1.05	0		
MCNA-14559	2.41	1.16	0.75	0		
MCNA-14560	2.58	1.75	1.15	0		
MCNA-14561	1.58	1.08	0.74	0		
MCNA-14562	1.92	1.33	0.88	0		
MCNA-14563	1.83	1.08	0.7	0		
MCNA-14564	2.25	0.91	0.62	0		
MCNA-14565	1.58	0.75	0.5	0		
<i>cf. Paronychodon</i>	MPZ98/76	2.74	1.49	0.6	0	
	MPZ98/77	2.79	1.39	0.6	0	
	MPZ98/78	2.23	1.21	0.84	0	
<i>cf. Richardoestesia</i> sp.	MCNA-14566	3.8	2	0.88	10.5625	0
	MCNA-14567	3.4	2	1	9.75	0
	MCNA-14568	4.92	3.58	1.67	6	8
	MCNA-14569	3.6	1.8	0.88	11.375	0
	MCNA-14570	2.92	2	0.8	10.5625	16.25
	MCNA-14571	2.8	1.2	0.72	9.75	14.625
	MCNA-14572	3.08	1.2	0.72	8.125	13
	MCNA-14573	2.96	1.52	0.84	11.375	0
	MCNA-14574	3.2	3.4	1.4	6.5	8.125
	MCNA-14575	3.24	2.04	2.24	11.375	16.25
	MCNA-14576	2.28	1.84	1.16	8.125	0
	MCNA-14577	3.2	2.68	1.6	10.5625	0
	MCNA-14578	3.88	2.48	1.12	8.125	0
	MCNA-14579	5.12	2.8	2	9.75	0
	MCNA-14580	3.64	2.2	1.28	9.75	0
	MCNA-14581	1.4	1.48	0.64	10.5625	0
	MCNA-14582	1.68	1.08	0.68	11.375	0
	MCNA-14583	3.08	2.4	1.2	6.5	8.125
	MCNA-14584	4	2.08	1.2	9.75	0
	MCNA-14585	4.4	3.2	1.6	6.5	8.125
MCNA-14586	2.96	3.76	1.8	8.125	0	

	MCNA-14587	4.16	2.52	1.2	7.3125	0
	MCNA-14588	6.6	5.08	2.16	6.5	0
	MCNA-14589	4.48	3.36	2.08	8.125	0
	MCNA-14590		2.88	1.28	6.5	0
	MCNA-14591	3.36	2	1	9.75	16.25
	MCNA-14592	3.4	1.88	0.76	8.125	0
	MCNA-14593	1.4	1.44	0.68	8.125	0
	MCNA-14594	1.44	1.6	0.68	9.75	0
	MCNA-14595	2.2	1.88	0.8	8.125	11.375
	MCNA-14596	2.24	1.76	0.88	6.825	9.75
	MCNA-14597	1.84	1.28	0.64	9.75	0
	MCNA-14598	1.84	1.2	0.6		
	MCNA-14599	2.2	1.8	0.72	9.75	13
	MCNA-14600	2.44	1.8	0.88		
	MCNA-14601	1.24	1.04	0.44	9.75	0
	MCNA-14602	2.28	1.44	0.64	8.125	9.75
	MCNA-14603	2.4	1.6	0.6	8.125	0
	MCNA-14604	7.4	5	1.48	8.125	0
	MCNA-14605	3.16	1.76	0.88	9.75	0
	MCNA-14606	2.53	2.15	1	7	10
	MCNA-14607	5	3	1.38	7	0
	MCNA-14608	3.62	2.69	1.15	6.5	0
	MCNA-14609	1.92	1.62	0.69	10	0
	MCNA-14610	1.92	1.38	0.77	9	9
	MCNA-14611	2.31	1	0.69	9	14
	MCNA-14612	3.1	1.83	0.75	9	0
	MCNA-14613	2.42	1.25	0.42	8	0
	MCNA-14614	4.25	1.92	0.83	8.5	0
	MCNA-14615	2.67	1.58	0.67	8	0
	MCNA-14616	2.92	2.083	0.67	8	0
	MCNA-14617	3.3	2.17	0.92	8	0
	MCNA-14618	4.58	2.75	1.42	7.5	0
	MCNA-14619	4.5	2.75	1.083	8	0
	MCNA-14620				3.25	0
	MCNA-14621				8.125	0
	DPM-MON-T5	2.4	1.44	0.6	7.75	0
	DPM-MON-T9	2.76	1.74	0.84	9	11.5
	DPM-VIR4-T6	1.54	1.43	0.74	9.5	0
	DPM-VIR4-T7	2.17	1.6	0.63	9.5	0
	MPZ98/74	3.02	1.39	0.6	8.2	0
	MPZ98/72	4.32	2.23	1.07	7.57	0
	MPZ98/73	3.35	2.19	0.93	10.87	0
	MPZ2004/7	2.1	1	0.4	10.00	14
cf Dromeosauridae indet.	MCNA-14622	3.44	2.6	1.32	4.875	8.125
	DPM-FON6-T2	16.3	7.5	5.75	3	0
	DPM-FIG2-T1+T2	12.1	6.7	4.3	2.5	0
	MPZ2004/6	17.5	11	4.4	3	3.5
cf. <i>Pyroraptor olympius</i>	MCNA-14623	8	5.4	2.4	6.5	9.75
	MCNA-14624	6.2	4.32	1.92	6.5	8.125
	MCNA-14625	3.85	3.1	1.40	6	8
	MCNA-14626	3.84	2.53	1.38	6	8
	DPM-MON-T1	6.3	3.3	2.4	6	0

Table 2. Discriminant analysis for the South Pyrenees Basin sample including *Richardoestesia*-like (Prieto-Marquez et al., 2000) and *Pyroraptor olympius* (Allain pers. communication). 79.2% correctly classified data. The data are shown in percentage values.

Taxa	Group								Total
	cf. <i>Richardoestesia</i> sp	cf. Dromaeosauridae indet.	cf. <i>Pyroraptor olympius</i> + <i>Pyroraptor olympius</i>	Coelurosauria indet	cf. <i>Paronychodon</i>	Theropoda indet. 1	Theropoda indet. 2	<i>Richardoestesia</i> -like	
cf. <i>Richardoestesia</i> sp	86.4	.0	11.9	.0	.0	.0	.0	1.7	100.0
cf. Dromaeosauridae indet.	.0	66.7	33.3	.0	.0	.0	.0	.0	100.0
cf. <i>Pyroraptor olympius</i> + <i>Pyroraptor olympius</i>	.0	.0	100.0	.0	.0	.0	.0	.0	100.0
Coelurosauria indet	.0	.0	.0	66.0	34.0	.0	.0	.0	100.0
cf. <i>Paronychodon</i>	.0	.0	.0	33.3	66.7	.0	.0	.0	100.0
Indeterminate theropod 1	.0	.0	.0	.0	.0	100.0	.0	.0	100.0
Indeterminate theropod 2	.0	.0	.0	.0	.0	.0	100.0	.0	100.0
<i>Richardoestesia</i> -like	.0	.0	.0	.0	.0	.0	.0	100.0	100.0

Table 3. Chronostratigraphic succession of theropod taxa from the upper Cretaceous of South Pyrenees Zone.

Age	Sites	Taxa
Upper Campanian	Vicari 4 Suterranya Figuerola 2	Coelurosauria indet. cf. <i>Richardoestesia</i> sp. “ <i>Richardoestesia</i> -like” cf. Dromaeosauridae indet.
Upper Campanian–lower Maastrichtian	Montrebei Laño	Indeterminate theropod Coelurosauria indet. cf. <i>Richardoestesia</i> sp. cf. Dromaeosauridae indet. cf. <i>Pyroraptor olympius</i> Ornithomimosauria indet. (?)
Lower Maastrichtian	Fontllonga 6	cf. Dromaeosauridae indet.
Upper Maastrichtian	Blasi 1 Blasi 2B Blasi 3	Indeterminate theropod Coelurosauria indet. cf. <i>Paronychodon</i> cf. <i>Richardoestesia</i> sp. cf. Dromaeosauridae indet.

Table 4. European theropod dinosaur record for the Campanian-upper Maastrichtian. (1) Csiki & Grigorescu 1998, (2) Buffetaut et al. 1986, (3), Buffetaut and Le Loeuff 1991, (4) Buffetaut and Le Loeuff 1997, (5) Pol et al. 1992 (6) Antunes and Sigogneau-Russell 1991, (7) Le Loeuff and Buffetaut 1991, (8), García et al. 2000, (9) Le Loeuff & Buffetaut 1998, (10) Allain and Taquet 2000, (11) Pereda-Suberbiola 1999a, (12) Jagt et al. 2003 (13) Bonde and Christiansen 2003 (14) Allain and Pereda-Suberbiola 2003, (15) Grigorescu 2003 (16) Prieto-Márquez et al. 2000, (17) Csiki et al. 2010, (18) Weishampel et al. 2010, (19) Ossi et al. 2010).

Country	Campanian-Maastrichtian Theropods
Belgium (12)	<i>Megalosaurus bredai</i>
Sweden (13)	Tyrannosauridae indet.
France	<i>Tarascosaurus salluvicus (nomen dubium)</i> (3, 4, 7, 14) Abelisaurid? (14) cf. <i>Paronychodon</i> (8) <i>Pyroraptor olympius</i> (10) Dromaeosauridae Deinonychosauria (2) <i>Variraptor mechinorum (nomen dubium)</i> (9,14)
Romania (1) (15) (18)	Theropoda indet. = <i>Megalosaurus hungaricus</i> = <i>Megalosaurus</i> sp. Theropoda indet. cf. <i>Euronychodon</i> (= <i>Paronychodon</i>) Dromaeosauridae Velociraptorinae “Troodon-like” <i>Elopteryx nopsai</i> <i>Bradycneme draculae</i> <i>Heptsteornis andrewsi</i> <i>Balaur bondoc</i> (17)
Hungary (19)	Basal Tetanure
Portugal (6) (11)	Theropoda indet. = <i>Megalosaurus</i> cf. <i>pannoniensis</i> <i>Euronychodon portucalensis</i> (= <i>Paronychodon</i>) Dromaeosauridae Troodontidae
Spain	Theropoda indet. (= Neoceratosauria indet.) (11) Coelurosauria indet. cf. <i>Paronychodon</i> cf. <i>Richardoestesia</i> sp. cf. <i>Dromeosauridae</i> indet. sp. cf. <i>Pyroraptor olympus</i> Ornithomimosauria indet. (11) <i>Richardoestesia</i> -like (16)