



Supplementary Information for
Reassessment of the phylogenetic relationships of the late Miocene
apes *Hispanopithecus* and *Rudapithecus* based on vestibular
morphology

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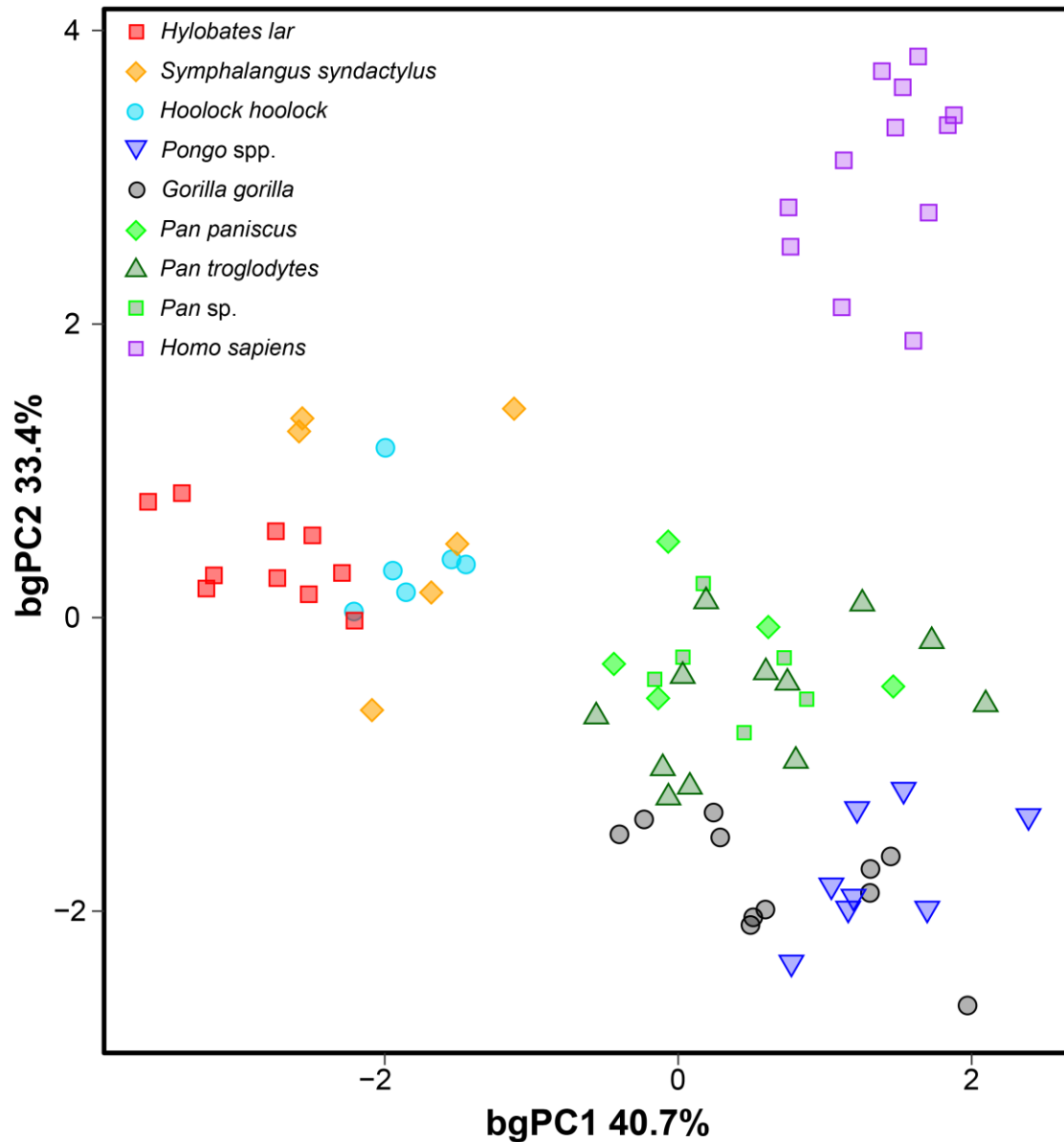


Fig. S1. Results of the cross-validated between-group principal component analysis (bgPCA). Scatterplot of bgPC2 vs. bgPC1 scores. The clear similarities between cross-validated bgPCA scores and regular ones (as shown in Fig. 3), except from a mirroring along the bgPC2 axis (which does affect the relative positioning of the clouds of points) and a very slight rotation of the morphospace, allow us to discount spurious grouping and prove the presence of a grouping structure embedded in our shape data.

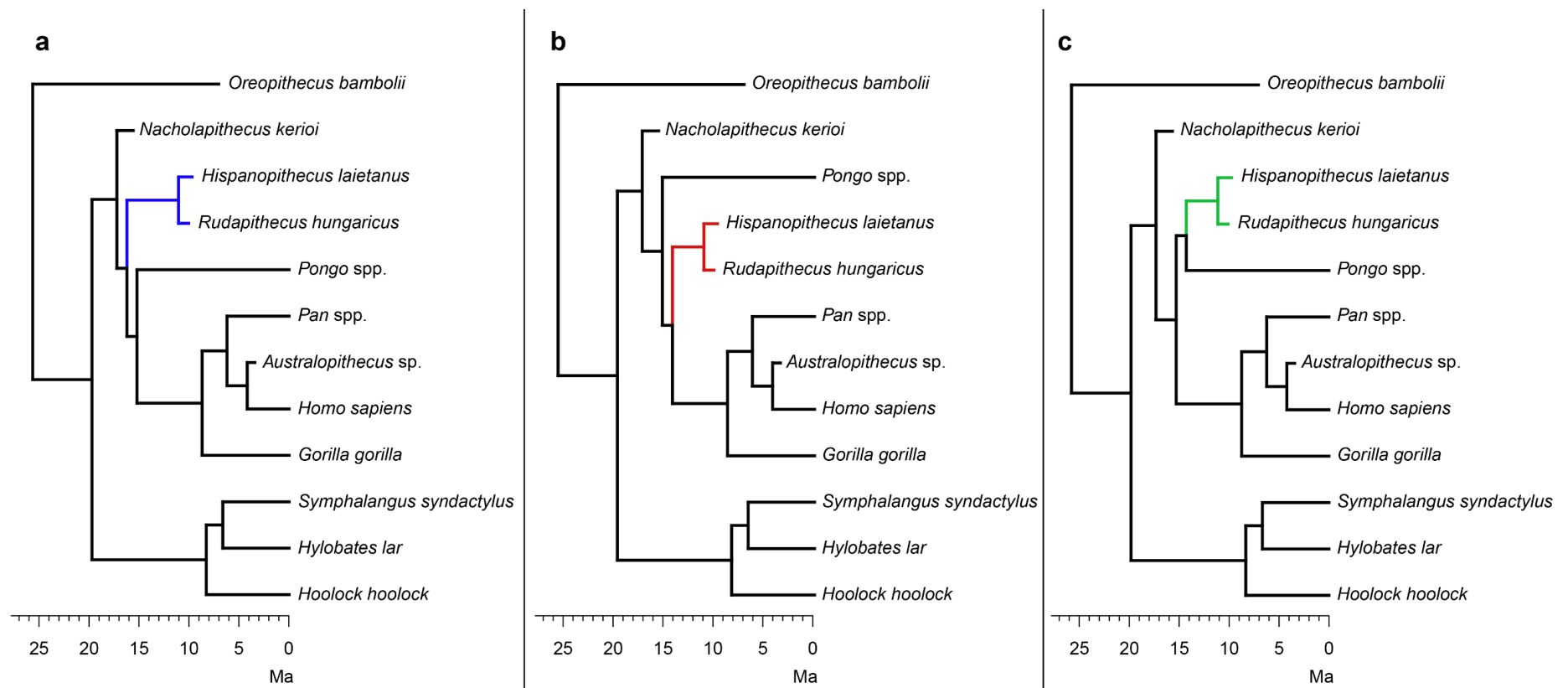


Fig. S2. Composite phylogenetic trees with the investigated Miocene dryopithecines as (a) stem hominids (blue), (b) stem hominines (red), and (c) stem pongines (green). The corresponding phylomorphospaces results are depicted in Fig. 6 of the main text for (b) and in SI Appendix, Fig. S3 for (a, c).

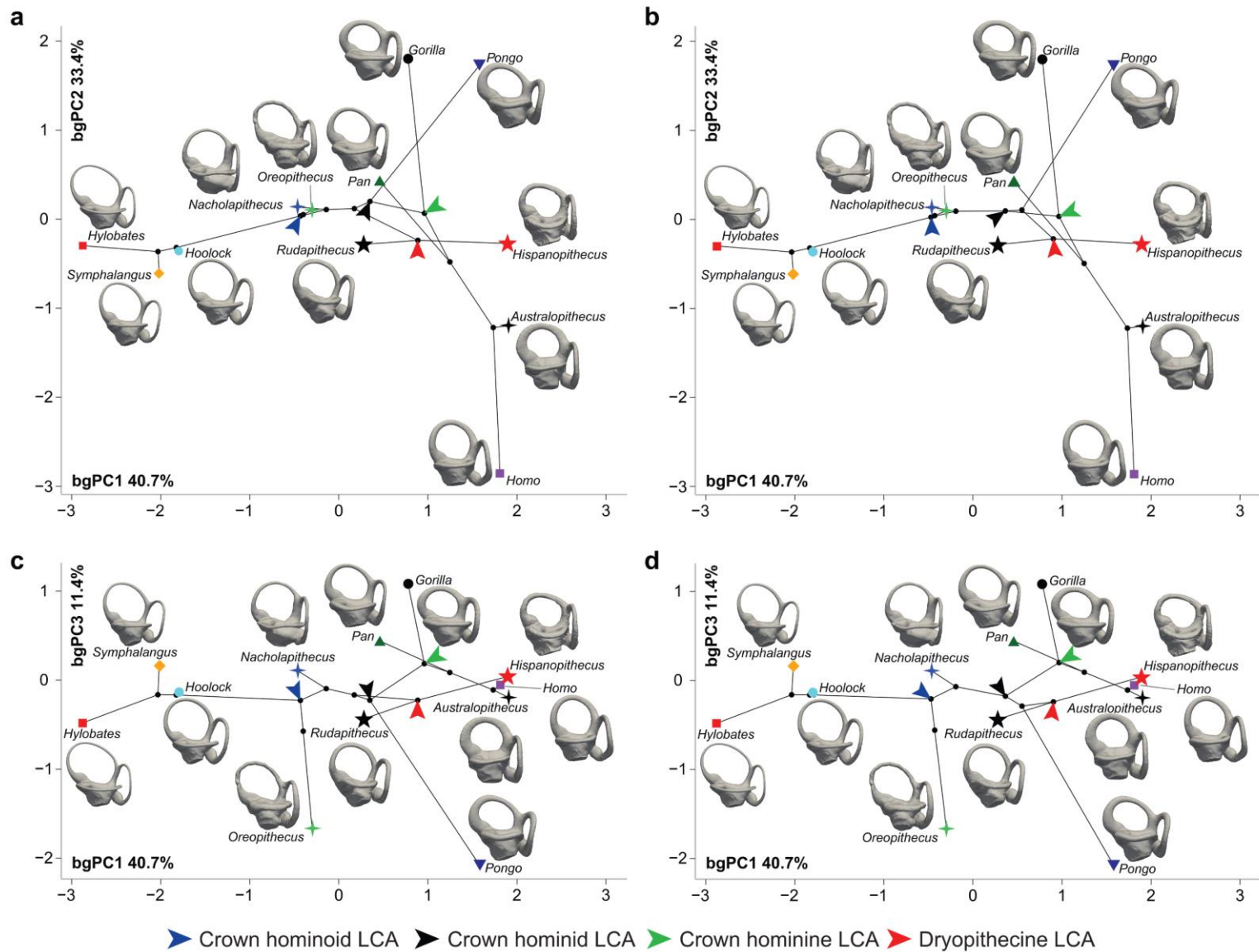


Fig. S3. Phylomorphospaces of the vestibular apparatus in hominoids, obtained by projecting the phylogenetic tree that considers dryopithecines a clade of stem hominids (a, c; see SI Appendix, Fig. S2a) and of stem pongines (b, d; see SI Appendix, Fig. S2c) on bivariate plots between bgPCs. The tips correspond to genus bgPCA score centroids: (a, c) bgPC2 vs. bgPC1; (b, d) bgPC3 vs. bgPC1. Key ancestral morphologies reconstructed using maximum likelihood for the last common ancestors (LCAs) of various clades are depicted by means of arrowheads.

Table S1. Log-transformed length (ln L, in mm) and volume cube root (ln VolSC, in mm) of the semicircular canals used for computing the allometric residuals using the non-hominid anthropoid regression as a baseline.

ID	Taxon	log L	log Vol	Residuals
DUEALP 02	<i>Alouatta palliata</i>	3.654	0.929	0.053
DUEALP 04	<i>Alouatta palliata</i>	3.529	0.699	-0.120
DUEALP 06	<i>Alouatta palliata</i>	3.658	0.920	0.042
DUEALP 10	<i>Alouatta palliata</i>	3.551	0.909	0.080
DUEALP 12	<i>Alouatta palliata</i>	3.660	0.867	-0.012
MCZ 10138	<i>Ateles geoffroyi</i>	3.685	1.033	0.143
MCZ 29626	<i>Ateles geoffroyi</i>	3.596	0.886	0.036
MCZ 29628	<i>Ateles geoffroyi</i>	3.620	0.985	0.125
MCZ 29658	<i>Ateles geoffroyi</i>	3.559	0.953	0.120
MCZ BOM 5351	<i>Ateles geoffroyi</i>	3.774	1.003	0.073
MCZ 27891	<i>Cebus apella</i>	3.407	0.873	0.110
MCZ 31063	<i>Cebus apella</i>	3.455	0.872	0.086
MCZ 37833	<i>Cebus apella</i>	3.522	0.908	0.092
MCZ 41090	<i>Cebus apella</i>	3.507	0.907	0.098
MCZ 49635	<i>Cebus apella</i>	3.526	0.901	0.083
AMNHM 52634	<i>Cercocebus galeritus</i>	3.661	0.891	0.011
AMNHM 52635	<i>Cercocebus galeritus</i>	3.737	0.845	-0.068
AMNHM 52640	<i>Cercocebus galeritus</i>	3.708	0.791	-0.109
AMNHM 52641	<i>Cercocebus galeritus</i>	3.691	0.860	-0.032
AMNHM 52645	<i>Cercocebus galeritus</i>	3.553	0.855	0.024
MCZ 22734	<i>Cercopithecus mitis</i>	3.447	0.758	-0.024
MCZ 25022	<i>Cercopithecus mitis</i>	3.349	0.773	0.036
MCZ 26832	<i>Cercopithecus mitis</i>	3.521	0.798	-0.018
MCZ 39389	<i>Cercopithecus mitis</i>	3.485	0.752	-0.047
MCZ 44264	<i>Cercopithecus mitis</i>	3.555	0.712	-0.119
SIU 4792	<i>Chlorocebus pygerythrus</i>	3.393	0.889	0.132
SIU 4793	<i>Chlorocebus pygerythrus</i>	3.529	0.941	0.122
SIU 4794	<i>Chlorocebus pygerythrus</i>	3.642	0.948	0.077
SIU 4795	<i>Chlorocebus pygerythrus</i>	3.484	0.905	0.106
SIU 4796	<i>Chlorocebus pygerythrus</i>	3.611	0.935	0.079
AMNHM 52211	<i>Colobus guereza</i>	3.737	0.894	-0.019
AMNHM 52213	<i>Colobus guereza</i>	3.720	0.913	0.007
AMNHM 52225	<i>Colobus guereza</i>	3.649	0.893	0.020
AMNHM 52237	<i>Colobus guereza</i>	3.743	0.890	-0.026
AMNHM 52249	<i>Colobus guereza</i>	3.819	0.806	-0.145
MCZ 37280	<i>Erythrocebus patas</i>	3.615	0.941	0.082
MCZ 47015	<i>Erythrocebus patas</i>	3.626	1.056	0.193
MCZ 47016	<i>Erythrocebus patas</i>	3.659	1.065	0.187
MCZ 47017	<i>Erythrocebus patas</i>	3.566	0.928	0.092
MCZ 47018	<i>Erythrocebus patas</i>	3.567	0.902	0.066
AMNHA 999686	<i>Gorilla gorilla</i>	3.807	1.261	0.316

AMNHA 999687	<i>Gorilla gorilla</i>	3.755	1.297	0.375
AMNHM 167338	<i>Gorilla gorilla</i>	3.905	1.351	0.362
AMNHM 54356	<i>Gorilla gorilla</i>	3.700	1.387	0.490
MCZ 17684	<i>Gorilla gorilla</i>	3.866	1.223	0.251
MCZ 26850	<i>Gorilla gorilla</i>	3.749	1.312	0.393
MCZ 37264	<i>Gorilla gorilla</i>	3.726	1.108	0.199
ESFR 50001994	<i>Gorilla gorilla</i>	3.741	1.351	0.436
EMBR 121	<i>Homo sapiens</i>	3.834	1.282	0.324
EMBR 179	<i>Homo sapiens</i>	3.853	1.294	0.328
EMBR 212	<i>Homo sapiens</i>	3.690	1.204	0.312
EMBR 215	<i>Homo sapiens</i>	3.733	1.347	0.435
EMBR 281	<i>Homo sapiens</i>	3.857	1.402	0.434
F01	<i>Homo sapiens</i>	3.775	1.311	0.380
F03	<i>Homo sapiens</i>	3.743	1.497	0.581
F04	<i>Homo sapiens</i>	3.769	1.291	0.363
F05	<i>Homo sapiens</i>	3.759	1.439	0.515
F06	<i>Homo sapiens</i>	3.766	1.451	0.524
AMNHM 112673	<i>Hoolock hoolock</i>	3.733	0.981	0.069
AMNHM 112720	<i>Hoolock hoolock</i>	3.728	0.951	0.041
AMNHM 112983	<i>Hoolock hoolock</i>	3.689	1.037	0.145
AMNHM 201742	<i>Hoolock hoolock</i>	3.765	1.071	0.145
AMNHM 83421	<i>Hoolock hoolock</i>	3.752	1.025	0.105
AMNHM 83425	<i>Hoolock hoolock</i>	3.747	0.941	0.023
AMNHM 201743	<i>Hoolock hoolock</i>	3.709	0.990	0.089
MCZ 41411	<i>Hylobates lar</i>	3.587	0.812	-0.034
MCZ 41412	<i>Hylobates lar</i>	3.677	0.886	0.000
MCZ 41416	<i>Hylobates lar</i>	3.725	0.815	-0.093
MCZ 41418	<i>Hylobates lar</i>	3.734	0.828	-0.084
MCZ 41421	<i>Hylobates lar</i>	3.650	0.858	-0.016
MCZ 41424	<i>Hylobates lar</i>	3.656	0.882	0.006
MCZ 41452	<i>Hylobates lar</i>	3.615	0.829	-0.029
AMNHM 184598	<i>Hylobates lar</i>	3.742	0.928	0.012
MCZ 41455	<i>Hylobates lar</i>	3.737	0.681	-0.233
MCZ 41469	<i>Hylobates lar</i>	3.701	0.808	-0.090
AMNHM 52596	<i>Lophocebus albigena</i>	3.686	0.881	-0.009
AMNHM 52603	<i>Lophocebus albigena</i>	3.753	0.933	0.013
AMNHM 52606	<i>Lophocebus albigena</i>	3.582	0.773	-0.070
AMNHM 52607	<i>Lophocebus albigena</i>	3.724	0.834	-0.073
AMNHM 52615	<i>Lophocebus albigena</i>	3.712	0.880	-0.023
MCZ 12758	<i>Macaca fascicularis</i>	3.541	0.855	0.031
MCZ 22277	<i>Macaca fascicularis</i>	3.618	0.752	-0.107
MCZ 23812	<i>Macaca fascicularis</i>	3.478	0.803	0.007
MCZ 23813	<i>Macaca fascicularis</i>	3.574	0.724	-0.116
MCZ 35765	<i>Macaca fascicularis</i>	3.566	0.754	-0.082
AMNHA 9912049	<i>Mandrillus sphinx</i>	3.677	0.923	0.036
AMNHA 9912056	<i>Mandrillus sphinx</i>	3.693	0.922	0.029

AMNHM 89362	<i>Mandrillus sphinx</i>	3.669	0.915	0.032
AMNHM 89364	<i>Mandrillus sphinx</i>	3.719	0.870	-0.036
AMNHM 89365	<i>Mandrillus sphinx</i>	3.614	0.856	-0.002
MCZ 19976	<i>Miopithecus talapoin</i>	3.385	0.742	-0.012
MCZ 23196	<i>Miopithecus talapoin</i>	3.466	0.791	0.001
MCZ 23197	<i>Miopithecus talapoin</i>	3.346	0.671	-0.065
MCZ 34264	<i>Miopithecus talapoin</i>	3.369	0.689	-0.057
MCZ 37278	<i>Miopithecus talapoin</i>	3.462	0.748	-0.041
MCZ 37342	<i>Nasalis larvatus</i>	3.692	0.949	0.056
MCZ 41555	<i>Nasalis larvatus</i>	3.670	0.834	-0.050
MCZ 41559	<i>Nasalis larvatus</i>	3.670	0.974	0.091
MCZ 41560	<i>Nasalis larvatus</i>	3.689	0.994	0.102
MCZ 41562	<i>Nasalis larvatus</i>	3.712	1.067	0.165
AMNHM 86857	<i>Pan paniscus</i>	3.691	1.120	0.227
IPS9033	<i>Pan paniscus</i>	3.680	1.079	0.192
MCZ 38018	<i>Pan paniscus</i>	3.691	1.086	0.193
MCZ 38019	<i>Pan paniscus</i>	3.579	1.092	0.250
MCZ 38020	<i>Pan paniscus</i>	3.650	1.170	0.296
ESFR 50001988	<i>Pan spp.</i>	3.846	1.235	0.272
ESFR 50001759	<i>Pan spp.</i>	3.743	1.222	0.306
ESFR 50001797	<i>Pan spp.</i>	3.777	1.302	0.370
ESFR 50002604	<i>Pan spp.</i>	3.752	1.144	0.223
ESFR 50001738	<i>Pan spp.</i>	3.839	1.252	0.292
ESFR 50001754	<i>Pan spp.</i>	3.793	1.246	0.307
AMNHM 167342	<i>Pan troglodytes</i>	3.672	1.193	0.309
AMNHM 167344	<i>Pan troglodytes</i>	3.702	1.155	0.257
AMNHM 51204	<i>Pan troglodytes</i>	3.737	1.212	0.299
IPS5698	<i>Pan troglodytes</i>	3.766	1.227	0.301
MCZ 17702	<i>Pan troglodytes</i>	3.667	1.051	0.170
MCZ 23167	<i>Pan troglodytes</i>	3.588	1.025	0.179
MCZ 26847	<i>Pan troglodytes</i>	3.636	1.082	0.215
ESFR 50001793	<i>Pan troglodytes</i>	3.691	1.266	0.374
ESFR 50001795	<i>Pan troglodytes</i>	3.672	1.190	0.306
ESFR 50001796	<i>Pan troglodytes</i>	3.588	1.226	0.380
ESFR 50001799	<i>Pan troglodytes</i>	3.671	1.207	0.323
MCZ 37260	<i>Pan troglodytes</i>	3.688	1.118	0.227
MCZ 46414	<i>Pan troglodytes</i>	3.641	1.020	0.150
MCZ 46415	<i>Pan troglodytes</i>	3.613	1.113	0.256
AMNHM 52677	<i>Papio anubis</i>	3.815	0.948	0.000
MCZ 17342	<i>Papio anubis</i>	3.643	0.855	-0.016
MCZ 26473	<i>Papio anubis</i>	3.677	0.863	-0.023
MCZ 31619	<i>Papio anubis</i>	3.855	0.896	-0.071
MCZ BOM 8466	<i>Papio anubis</i>	3.594	0.872	0.023
MCZ 24080	<i>Piliocolobus badius</i>	3.496	0.649	-0.155
MCZ 24775	<i>Piliocolobus badius</i>	3.598	0.609	-0.241
MCZ 24793	<i>Piliocolobus badius</i>	3.588	0.685	-0.161

MCZ 25627	<i>Piliocolobus badius</i>	3.512	0.624	-0.188
MCZ 25631	<i>Piliocolobus badius</i>	3.604	0.694	-0.159
IPS10647	<i>Pongo</i> sp.	3.660	1.363	0.485
IPS10651	<i>Pongo</i> sp.	3.750	1.342	0.423
IPS9031	<i>Pongo</i> sp.	3.500	1.205	0.399
IPSSN	<i>Pongo</i> sp.	3.662	1.231	0.352
MHNTZOO 201108	<i>Pongo</i> sp.	3.626	1.270	0.407
SENCK 1576UU	<i>Pongo</i> sp.	3.712	1.298	0.396
ESRF 50001801	<i>Pongo</i> sp.	3.663	1.395	0.515
SENCK 6782	<i>Pongo</i> sp.	3.759	1.327	0.404
MCZ 35621	<i>Presbytis hosei</i>	3.562	0.681	-0.153
MCZ 37370	<i>Presbytis hosei</i>	3.579	0.837	-0.005
MCZ 37371	<i>Presbytis hosei</i>	3.619	0.775	-0.085
MCZ 37372	<i>Presbytis hosei</i>	3.516	0.651	-0.162
MCZ 37772	<i>Presbytis hosei</i>	3.616	0.841	-0.018
MCZ 22276	<i>Presbytis rubicunda</i>	3.732	0.747	-0.164
MCZ 35704	<i>Presbytis rubicunda</i>	3.663	0.811	-0.069
MCZ 35705	<i>Presbytis rubicunda</i>	3.693	0.836	-0.058
MCZ 35706	<i>Presbytis rubicunda</i>	3.641	0.868	-0.002
MCZ 35712	<i>Presbytis rubicunda</i>	3.678	0.877	-0.010
AMNHM 102724	<i>Symphalangus syndactylus</i>	3.671	0.964	0.080
AMNHM 106583	<i>Symphalangus syndactylus</i>	3.739	0.952	0.038
MCZ 36031	<i>Symphalangus syndactylus</i>	3.732	0.881	-0.030
MCZ 36032	<i>Symphalangus syndactylus</i>	3.793	0.849	-0.091
EA 258	<i>Symphalangus syndactylus</i>	3.774	1.111	0.181
ESFR 50001912	<i>Symphalangus syndactylus</i>	3.881	1.095	0.116
AMNHM 19549	<i>Theropithecus gelada</i>	3.667	0.946	0.064
AMNHM 238034	<i>Theropithecus gelada</i>	3.606	0.740	-0.114
AMNHM 60568	<i>Theropithecus gelada</i>	3.627	0.890	0.026
AMNHM 80126	<i>Theropithecus gelada</i>	3.661	0.807	-0.072
AMNHM 90309	<i>Theropithecus gelada</i>	3.630	0.871	0.006
MCZ 35567	<i>Trachypithecus cristatus</i>	3.599	0.888	0.036
MCZ 35584	<i>Trachypithecus cristatus</i>	3.639	0.940	0.071
MCZ 35586	<i>Trachypithecus cristatus</i>	3.653	0.937	0.062
MCZ 35597	<i>Trachypithecus cristatus</i>	3.651	0.889	0.015
MCZ 35603	<i>Trachypithecus cristatus</i>	3.664	0.947	0.066
RUD 77L	<i>Rudapithecus hungaricus</i>	3.586	1.008	0.163
RUD 77R	<i>Rudapithecus hungaricus</i>	3.565	1.009	0.173
RUD 200	<i>Rudapithecus hungaricus</i>	3.607	1.096	0.241
IPS18000	<i>Hispanopithecus laietanus</i>	3.582	1.166	0.323
BAC 208	<i>Oreopithecus bambolii</i>	3.802	1.175	0.231
BG 42744	<i>Nacholapithecus kerioi</i>	3.629	1.026	0.161
StW 573	<i>Australopithecus</i> sp.	3.697	1.230	0.335
StW 578	<i>Australopithecus</i> sp.	3.643	1.239	0.368

Table S2. Results of group mean differences tests computed for the raw shape data, the standard between-group principal components analysis (bgPCA) scores, and cross-validated bgPCA scores. Significant differences are recovered in all instances. The amount of variance (R^2) explained by group differences increases slightly between the raw data and bgPCA scores (both standard and cross-validated). The difference in R^2 between standard bgPCA and cross-validated bgPCA are minimal.

Shape data	p	R^2
Full dataspace	< 0.001	0.624
bgPCA scores	< 0.001	0.852
Cross-validated bgPCA scores	< 0.001	0.836

Table S3. Voxel size for the sample used in this paper, indicating those used in ref. 1 and those newly added in this study.

Species	ID	Source	Voxel size	Sex	DOI	MorphoSource ID	Source
<i>Alouatta palliata</i>	DUEALP 02	MorphoSource	0.06	M	-	S1923	Urciuoli et al., 2020
<i>Alouatta palliata</i>	DUEALP 04	MorphoSource	0.05	M	-	S1924	Urciuoli et al., 2020
<i>Alouatta palliata</i>	DUEALP 06	MorphoSource	0.07	M	-	S78	Urciuoli et al., 2020
<i>Alouatta palliata</i>	DUEALP 10	MorphoSource	0.05	F	-	S1926	Urciuoli et al., 2020
<i>Alouatta palliata</i>	DUEALP 12	MorphoSource	0.06	F	-	S79	Urciuoli et al., 2020
<i>Ateles geoffroyi</i>	MCZ 10138	MorphoSource	0.06	F	http://dx.doi.org/10.17602/M2/M2917	S971	Urciuoli et al., 2020
<i>Ateles geoffroyi</i>	MCZ 29626	MorphoSource	0.06	F	http://dx.doi.org/10.17602/M2/M2918	S972	Urciuoli et al., 2020
<i>Ateles geoffroyi</i>	MCZ 29628	MorphoSource	0.06	F	http://dx.doi.org/10.17602/M2/M2919	S973	Urciuoli et al., 2020
<i>Ateles geoffroyi</i>	MCZ 29658	MorphoSource	0.06	F	http://dx.doi.org/10.17602/M2/M2920	S974	Urciuoli et al., 2020
<i>Ateles geoffroyi</i>	MCZ BOM 5351	MorphoSource	0.06	M	http://dx.doi.org/10.17602/M2/M2889	S943	Urciuoli et al., 2020
<i>Cebus apella</i>	MCZ 27891	MorphoSource	0.06	M	http://dx.doi.org/10.17602/M2/M5208	S1725	Urciuoli et al., 2020
<i>Cebus apella</i>	MCZ 31063	MorphoSource	0.07	F	http://dx.doi.org/10.17602/M2/M5213	S1730	Urciuoli et al., 2020
<i>Cebus apella</i>	MCZ 37833	MorphoSource	0.06	M	http://dx.doi.org/10.17602/M2/M5218	S1736	Urciuoli et al., 2020
<i>Cebus apella</i>	MCZ 41090	MorphoSource	0.05	F	http://dx.doi.org/10.17602/M2/M5219	S1737	Urciuoli et al., 2020
<i>Cebus apella</i>	MCZ 49635	MorphoSource	0.06	M	http://dx.doi.org/10.17602/M2/M5220	S1738	Urciuoli et al., 2020
<i>Cercocebus galeritus</i>	AMNHM 52634	MorphoSource	0.06	M	-	S4019	Urciuoli et al., 2020
<i>Cercocebus galeritus</i>	AMNHM 52635	MorphoSource	0.06	F	-	S4024	Urciuoli et al., 2020
<i>Cercocebus galeritus</i>	AMNHM 52640	MorphoSource	0.06	F	-	S4025	Urciuoli et al., 2020
<i>Cercocebus galeritus</i>	AMNHM 52641	MorphoSource	0.07	M	-	S1513	Urciuoli et al., 2020
<i>Cercocebus galeritus</i>	AMNHM 52645	MorphoSource	0.08	M	-	S4026	Urciuoli et al., 2020
<i>Cercopithecus mitis</i>	MCZ 22734	MorphoSource	0.08	F	http://dx.doi.org/10.17602/M2/M2928	S982	Urciuoli et al., 2020
<i>Cercopithecus mitis</i>	MCZ 25022	MorphoSource	0.08	F	http://dx.doi.org/10.17602/M2/M2929	S983	Urciuoli et al., 2020
<i>Cercopithecus mitis</i>	MCZ 26832	MorphoSource	0.08	F	http://dx.doi.org/10.17602/M2/M2930	S984	Urciuoli et al., 2020
<i>Cercopithecus mitis</i>	MCZ 39389	MorphoSource	0.08	F	http://dx.doi.org/10.17602/M2/M2933	S988	Urciuoli et al., 2020
<i>Cercopithecus mitis</i>	MCZ 44264	MorphoSource	0.08	F	http://dx.doi.org/10.17602/M2/M2935	S990	Urciuoli et al., 2020
<i>Chlorocebus pygerythrus</i>	SIU 4792	MorphoSource	0.05	F	-	S4036	Urciuoli et al., 2020
<i>Chlorocebus pygerythrus</i>	SIU 4793	MorphoSource	0.05	F	-	S4037	Urciuoli et al., 2020

<i>Chlorocebus pygerythrus</i>	SIU 4794	MorphoSource	0.05	F	-	S4038	Urciuoli et al., 2020
<i>Chlorocebus pygerythrus</i>	SIU 4795	MorphoSource	0.05	M	-	S4039	Urciuoli et al., 2020
<i>Chlorocebus pygerythrus</i>	SIU 4796	MorphoSource	0.05	M	-	S4040	Urciuoli et al., 2020
<i>Colobus guereza</i>	AMNHM 52211	MorphoSource	0.07	M	-	S1143	Urciuoli et al., 2020
<i>Colobus guereza</i>	AMNHM 52213	MorphoSource	0.07	F	-	S3768	Urciuoli et al., 2020
<i>Colobus guereza</i>	AMNHM 52225	MorphoSource	0.05	F	-	S1147	Urciuoli et al., 2020
<i>Colobus guereza</i>	AMNHM 52237	MorphoSource	0.07	M	-	S1148	Urciuoli et al., 2020
<i>Colobus guereza</i>	AMNHM 52249	MorphoSource	0.07	F	-	S3770	Urciuoli et al., 2020
<i>Erythrocebus patas</i>	MCZ 37280	MorphoSource	0.08	M	http://dx.doi.org/10.17602/M2/M2922	S976	Urciuoli et al., 2020
<i>Erythrocebus patas</i>	MCZ 47015	MorphoSource	0.08	M	http://dx.doi.org/10.17602/M2/M2923	S977	Urciuoli et al., 2020
<i>Erythrocebus patas</i>	MCZ 47016	MorphoSource	0.08	M	http://dx.doi.org/10.17602/M2/M2924	S978	Urciuoli et al., 2020
<i>Erythrocebus patas</i>	MCZ 47017	MorphoSource	0.06	F	http://dx.doi.org/10.17602/M2/M2925	S979	Urciuoli et al., 2020
<i>Erythrocebus patas</i>	MCZ 47018	MorphoSource	0.08	F	http://dx.doi.org/10.17602/M2/M2926	S980	Urciuoli et al., 2020
<i>Gorilla gorilla</i>	AMNHA 999686	MorphoSource	0.13	M	-	S5189	Urciuoli et al., 2020
<i>Gorilla gorilla</i>	AMNHA 999687	MorphoSource	0.08	F	-	S5186	Urciuoli et al., 2020
<i>Gorilla gorilla</i>	AMNHM 167338	MorphoSource	0.13	M	-	S5128	Urciuoli et al., 2020
<i>Gorilla gorilla</i>	AMNHM 54356	MorphoSource	0.11	F	-	S5125	Urciuoli et al., 2020
<i>Gorilla gorilla</i>	MCZ 17684	MorphoSource	0.13	F	http://dx.doi.org/10.17602/M2/M2943	S644	Urciuoli et al., 2020
<i>Gorilla gorilla</i>	MCZ 26850	MorphoSource	0.12	F	http://dx.doi.org/10.17602/M2/M2947	S995	Urciuoli et al., 2020
<i>Gorilla gorilla</i>	MCZ 37264	MorphoSource	0.13	F	http://dx.doi.org/10.17602/M2/M2949	S997	Urciuoli et al., 2020
<i>Gorilla gorilla</i>	MCZ 14750	MorphoSource	0.13	F	-	S993	This study
<i>Gorilla gorilla</i>	MCZ 37625	MorphoSource	0.12	F	-	S998	This study
<i>Gorilla gorilla</i>	MCZ 49006	MorphoSource	0.13	F	-	S1002	This study
<i>Gorilla gorilla</i>	ESFR 50001994	ESFR	0.05	F	-	-	This study
<i>Homo sapiens</i>	EMBR 121	PSU	0.04	F	-	-	Urciuoli et al., 2020
<i>Homo sapiens</i>	EMBR 179	PSU	0.04	M	-	-	Urciuoli et al., 2020
<i>Homo sapiens</i>	EMBR 212	PSU	0.04	F	-	-	Urciuoli et al., 2020
<i>Homo sapiens</i>	EMBR 215	PSU	0.04	M	-	-	Urciuoli et al., 2020
<i>Homo sapiens</i>	EMBR 281	PSU	0.04	F	-	-	Urciuoli et al., 2020
<i>Homo sapiens</i>	EMBR 473	PSU	0.04	M	-	-	This study

<i>Homo sapiens</i>	EMBR 479	PSU	0.04	M	-	-	This study
<i>Homo sapiens</i>	EMBR 583	PSU	0.04	F	-	-	This study
<i>Homo sapiens</i>	F01	Wimmer et al., 2019	0.06	?	-	-	This study
<i>Homo sapiens</i>	F03	Wimmer et al., 2019	0.06	?	-	-	This study
<i>Homo sapiens</i>	F04	Wimmer et al., 2019	0.06	?	-	-	This study
<i>Homo sapiens</i>	F05	Wimmer et al., 2019	0.06	?	-	-	This study
<i>Homo sapiens</i>	F06	Wimmer et al., 2019	0.06	?	-	-	This study
<i>Hoolock hoolock</i>	AMNHM 112673	MorphoSource	0.04	F	-	S6216	Urciuoli et al., 2020
<i>Hoolock hoolock</i>	AMNHM 112720	MorphoSource	0.05	F	-	S1206	Urciuoli et al., 2020
<i>Hoolock hoolock</i>	AMNHM 112983	MorphoSource	0.04	M	-	S6213	Urciuoli et al., 2020
<i>Hoolock hoolock</i>	AMNHM 201742	MorphoSource	0.07	F	-	S8066	Urciuoli et al., 2020
<i>Hoolock hoolock</i>	AMNHM 83421	MorphoSource	0.04	M	-	S6217	Urciuoli et al., 2020
<i>Hoolock hoolock</i>	AMNHM 83425	AMNH	0.08	F	-	S1209	Urciuoli et al., 2020
<i>Hoolock hoolock</i>	AMNHM 201743	AMNH	0.06	F	-	S12604	This study
<i>Hylobates lar</i>	MCZ 41411	MorphoSource	0.07	F	http://dx.doi.org/10.17602/M2/M2959	S1004	Urciuoli et al., 2020
<i>Hylobates lar</i>	MCZ 41412	MorphoSource	0.07	F	http://dx.doi.org/10.17602/M2/M2961	S1005	Urciuoli et al., 2020
<i>Hylobates lar</i>	MCZ 41416	MorphoSource	0.07	F	http://dx.doi.org/10.17602/M2/M2965	S1007	Urciuoli et al., 2020
<i>Hylobates lar</i>	MCZ 41418	MorphoSource	0.07	F	http://dx.doi.org/10.17602/M2/M2967	S1008	Urciuoli et al., 2020
<i>Hylobates lar</i>	MCZ 41421	MorphoSource	0.07	F	http://dx.doi.org/10.17602/M2/M2969	S1009	Urciuoli et al., 2020
<i>Hylobates lar</i>	MCZ 41424	MorphoSource	0.07	F	http://dx.doi.org/10.17602/M2/M3007	S1017	Urciuoli et al., 2020
<i>Hylobates lar</i>	MCZ 41452	MorphoSource	0.07	F	http://dx.doi.org/10.17602/M2/M3011	S1022	Urciuoli et al., 2020
<i>Hylobates lar</i>	AMNHM 184598	MorphoSource	0.04	M	-	S6214	This study
<i>Hylobates lar</i>	MCZ 41455	MorphoSource	0.07	F	-	S1024	This study
<i>Hylobates lar</i>	MCZ 41469	MorphoSource	0.07	F	-	S1029	This study
<i>Lophocebus albigena</i>	AMNHM 52596	MorphoSource	0.07	M	-	S4015	Urciuoli et al., 2020
<i>Lophocebus albigena</i>	AMNHM 52603	MorphoSource	0.06	F	-	S694	Urciuoli et al., 2020
<i>Lophocebus albigena</i>	AMNHM 52606	MorphoSource	0.07	M	-	S4005	Urciuoli et al., 2020
<i>Lophocebus albigena</i>	AMNHM 52607	MorphoSource	0.09	F	-	S4016	Urciuoli et al., 2020
<i>Lophocebus albigena</i>	AMNHM 52615	MorphoSource	0.07	F	-	S3767	Urciuoli et al., 2020
<i>Macaca fascicularis</i>	MCZ 12758	MorphoSource	0.06	F	http://dx.doi.org/10.17602/M2/M3028	S1032	Urciuoli et al., 2020

<i>Macaca fascicularis</i>	MCZ 22277	MorphoSource	0.06	F	http://dx.doi.org/10.17602/M2/M3029	S1033	Urciuoli et al., 2020
<i>Macaca fascicularis</i>	MCZ 23812	MorphoSource	0.06	M	http://dx.doi.org/10.17602/M2/M3030	S1034	Urciuoli et al., 2020
<i>Macaca fascicularis</i>	MCZ 23813	MorphoSource	0.06	F	http://dx.doi.org/10.17602/M2/M3031	S1035	Urciuoli et al., 2020
<i>Macaca fascicularis</i>	MCZ 35765	MorphoSource	0.06	F	http://dx.doi.org/10.17602/M2/M3033	S1037	Urciuoli et al., 2020
<i>Mandrillus sphinx</i>	AMNHA 9912049	MorphoSource	0.08	M	-	S5815	Urciuoli et al., 2020
<i>Mandrillus sphinx</i>	AMNHA 9912056	MorphoSource	0.08	M	-	S5816	Urciuoli et al., 2020
<i>Mandrillus sphinx</i>	AMNHM 89362	MorphoSource	0.08	M	-	S4595	Urciuoli et al., 2020
<i>Mandrillus sphinx</i>	AMNHM 89364	MorphoSource	0.10	M	-	S4596	Urciuoli et al., 2020
<i>Mandrillus sphinx</i>	AMNHM 89365	MorphoSource	0.06	M	-	S4213	Urciuoli et al., 2020
<i>Miopithecus talapoin</i>	MCZ 19976	MorphoSource	0.05	M	http://dx.doi.org/10.17602/M2/M5095	S1666	Urciuoli et al., 2020
<i>Miopithecus talapoin</i>	MCZ 23196	MorphoSource	0.05	M	http://dx.doi.org/10.17602/M2/M5094	S1665	Urciuoli et al., 2020
<i>Miopithecus talapoin</i>	MCZ 23197	MorphoSource	0.05	M	http://dx.doi.org/10.17602/M2/M5093	S1664	Urciuoli et al., 2020
<i>Miopithecus talapoin</i>	MCZ 34264	MorphoSource	0.05	F	http://dx.doi.org/10.17602/M2/M5092	S1663	Urciuoli et al., 2020
<i>Miopithecus talapoin</i>	MCZ 37278	MorphoSource	0.05	F	http://dx.doi.org/10.17602/M2/M5086	S1657	Urciuoli et al., 2020
<i>Nasalis larvatus</i>	MCZ 37342	MorphoSource	0.07	F	http://dx.doi.org/10.17602/M2/M5079	S1653	Urciuoli et al., 2020
<i>Nasalis larvatus</i>	MCZ 41555	MorphoSource	0.07	F	http://dx.doi.org/10.17602/M2/M5059	S1644	Urciuoli et al., 2020
<i>Nasalis larvatus</i>	MCZ 41559	MorphoSource	0.07	F	http://dx.doi.org/10.17602/M2/M5057	S1577	Urciuoli et al., 2020
<i>Nasalis larvatus</i>	MCZ 41560	MorphoSource	0.07	F	http://dx.doi.org/10.17602/M2/M5056	S1642	Urciuoli et al., 2020
<i>Nasalis larvatus</i>	MCZ 41562	MorphoSource	0.07	F	http://dx.doi.org/10.17602/M2/M5055	S1641	Urciuoli et al., 2020
<i>Pan paniscus</i>	AMNHM 86857	AMNH	0.12	F	-	-	Urciuoli et al., 2020
<i>Pan paniscus</i>	IPS9033	CENIEH	0.07	F	-	-	Urciuoli et al., 2020
<i>Pan paniscus</i>	MCZ 38018	MorphoSource	0.09	M	http://dx.doi.org/10.17602/M2/M4399	S1333	Urciuoli et al., 2020
<i>Pan paniscus</i>	MCZ 38019	MorphoSource	0.09	F	http://dx.doi.org/10.17602/M2/M4398	S1332	Urciuoli et al., 2020
<i>Pan paniscus</i>	MCZ 38020	MorphoSource	0.10	F	http://dx.doi.org/10.17602/M2/M4397	S1331	Urciuoli et al., 2020
<i>Pan sp.</i>	ESFR 50001988	ESFR	0.05	?	-	-	This study
<i>Pan sp.</i>	ESFR 50001759	ESFR	0.05	?	-	-	This study
<i>Pan sp.</i>	ESFR 50001797	ESFR	0.02	?	-	-	This study
<i>Pan sp.</i>	ESFR 50002604	ESFR	0.05	?	-	-	This study
<i>Pan sp.</i>	ESFR 50001738	ESFR	0.05	?	-	-	This study
<i>Pan sp.</i>	ESFR 50001754	ESFR	0.05	M	-	-	This study

<i>Pan troglodytes</i>	AMNHM 167342	MorphoSource	0.09	M	-	S5129	Urciuoli et al., 2020
<i>Pan troglodytes</i>	AMNHM 167344	MorphoSource	0.11	M	-	S5313	Urciuoli et al., 2020
<i>Pan troglodytes</i>	AMNHM 51204	MorphoSource	0.08	M	-	S4610	Urciuoli et al., 2020
<i>Pan troglodytes</i>	IPS5698	CENIEH	0.08	M	-	-	Urciuoli et al., 2020
<i>Pan troglodytes</i>	MCZ 17702	MorphoSource	0.10	F	http://dx.doi.org/10.17602/M2/M4395	S1330	Urciuoli et al., 2020
<i>Pan troglodytes</i>	MCZ 23167	MorphoSource	0.11	F	http://dx.doi.org/10.17602/M2/M4390	S1326	Urciuoli et al., 2020
<i>Pan troglodytes</i>	MCZ 26847	MorphoSource	0.10	F	http://dx.doi.org/10.17602/M2/M4389	S1325	Urciuoli et al., 2020
<i>Pan troglodytes</i>	ESFR 50001793	ESFR	0.05	F	-	-	This study
<i>Pan troglodytes</i>	ESFR 50001795	ESFR	0.05	?	-	-	This study
<i>Pan troglodytes</i>	ESFR 50001796	ESFR	0.05	?	-	-	This study
<i>Pan troglodytes</i>	ESFR 50001799	ESFR	0.05	M	-	-	This study
<i>Pan troglodytes</i>	MCZ 37260	MCZ	0.10	F	-	S1323	This study
<i>Pan troglodytes</i>	MCZ 46414	MCZ	0.08	F	-	S1322	This study
<i>Pan troglodytes</i>	MCZ 46415	MCZ	0.09	F	-	-	This study
<i>Papio anubis</i>	AMNHM 52677	MorphoSource	0.09	M	-	S4027	Urciuoli et al., 2020
<i>Papio anubis</i>	MCZ 17342	MorphoSource	0.11	M	http://dx.doi.org/10.17602/M2/M4885	S1615	Urciuoli et al., 2020
<i>Papio anubis</i>	MCZ 26473	MorphoSource	0.10	F	http://dx.doi.org/10.17602/M2/M4890	S1618	Urciuoli et al., 2020
<i>Papio anubis</i>	MCZ 31619	MorphoSource	0.11	F	http://dx.doi.org/10.17602/M2/M4892	S1620	Urciuoli et al., 2020
<i>Papio anubis</i>	MCZ BOM 8466	MorphoSource	0.08	M	http://dx.doi.org/10.17602/M2/M4889	S1617	Urciuoli et al., 2020
<i>Piliocolobus badius</i>	MCZ 24080	MorphoSource	0.08	M	http://dx.doi.org/10.17602/M2/M2892	S947	Urciuoli et al., 2020
<i>Piliocolobus badius</i>	MCZ 24775	MorphoSource	0.09	M	http://dx.doi.org/10.17602/M2/M2893	S948	Urciuoli et al., 2020
<i>Piliocolobus badius</i>	MCZ 24793	MorphoSource	0.08	F	http://dx.doi.org/10.17602/M2/M2894	S949	Urciuoli et al., 2020
<i>Piliocolobus badius</i>	MCZ 25627	MorphoSource	0.08	M	http://dx.doi.org/10.17602/M2/M2895	S950	Urciuoli et al., 2020
<i>Piliocolobus badius</i>	MCZ 25631	MorphoSource	0.09	M	http://dx.doi.org/10.17602/M2/M2896	S951	Urciuoli et al., 2020
<i>Pongo sp.</i>	IPS10647	CENIEH	0.08	F	-	-	Urciuoli et al., 2020
<i>Pongo sp.</i>	IPS10651	CENIEH	0.08	F	-	-	Urciuoli et al., 2020
<i>Pongo sp.</i>	IPS9031	CENIEH	0.08	F	-	-	Urciuoli et al., 2020
<i>Pongo sp.</i>	IPSSN	CENIEH	0.08	F	-	-	Urciuoli et al., 2020
<i>Pongo sp.</i>	MHNTZOO 201108	PSU	0.04	?	-	-	Urciuoli et al., 2020

<i>Pongo</i> sp.	SENCK 1576UU	PSU	0.01	?	-	-	Urciuoli et al., 2020
<i>Pongo</i> sp.	ESRF 50001801	ESFR	0.05	M	-	-	This study
<i>Pongo</i> sp.	SENCK 6782	PSU	0.01	?	-	-	This study
<i>Presbytis hosei</i>	MCZ 35621	MorphoSource	0.08	F	http://dx.doi.org/10.17602/M2/M4611	S1455	Urciuoli et al., 2020
<i>Presbytis hosei</i>	MCZ 37370	MorphoSource	0.08	F	http://dx.doi.org/10.17602/M2/M4610	S1454	Urciuoli et al., 2020
<i>Presbytis hosei</i>	MCZ 37371	MorphoSource	0.08	M	http://dx.doi.org/10.17602/M2/M4609	S1453	Urciuoli et al., 2020
<i>Presbytis hosei</i>	MCZ 37372	MorphoSource	0.08	F	http://dx.doi.org/10.17602/M2/M4608	S1452	Urciuoli et al., 2020
<i>Presbytis hosei</i>	MCZ 37772	MorphoSource	0.08	F	http://dx.doi.org/10.17602/M2/M4607	S1451	Urciuoli et al., 2020
<i>Presbytis rubicunda</i>	MCZ 22276	MorphoSource	0.08	M	http://dx.doi.org/10.17602/M2/M4557	S1423	Urciuoli et al., 2020
<i>Presbytis rubicunda</i>	MCZ 35704	MorphoSource	0.08	F	http://dx.doi.org/10.17602/M2/M4552	S1419	Urciuoli et al., 2020
<i>Presbytis rubicunda</i>	MCZ 35705	MorphoSource	0.08	F	http://dx.doi.org/10.17602/M2/M4551	S1418	Urciuoli et al., 2020
<i>Presbytis rubicunda</i>	MCZ 35706	MorphoSource	0.08	F	http://dx.doi.org/10.17602/M2/M4556	S1422	Urciuoli et al., 2020
<i>Presbytis rubicunda</i>	MCZ 35712	MorphoSource	0.08	M	http://dx.doi.org/10.17602/M2/M4555	S1421	Urciuoli et al., 2020
<i>Symphalangus syndactylus</i>	AMNHM 102724	MorphoSource	0.06	M	-	S5810	Urciuoli et al., 2020
<i>Symphalangus syndactylus</i>	AMNHM 106583	AMNH	0.08	F	-	-	Urciuoli et al., 2020
<i>Symphalangus syndactylus</i>	MCZ 36031	MorphoSource	0.08	M	http://dx.doi.org/10.17602/M2/M4444	S1359	Urciuoli et al., 2020
<i>Symphalangus syndactylus</i>	MCZ 36032	MorphoSource	0.07	F	http://dx.doi.org/10.17602/M2/M4443	S1358	Urciuoli et al., 2020
<i>Symphalangus syndactylus</i>	EA 258	MorphoSource	0.11	?	-	S15647	This study
<i>Symphalangus syndactylus</i>	ESFR 50001912	ESFR	0.02	?	-	-	This study
<i>Theropithecus gelada</i>	AMNHM 19549	MorphoSource	0.08	M	-	S4588	Urciuoli et al., 2020
<i>Theropithecus gelada</i>	AMNHM 238034	MorphoSource	0.12	F	-	S4589	Urciuoli et al., 2020
<i>Theropithecus gelada</i>	AMNHM 60568	MorphoSource	0.08	M	-	S4042	Urciuoli et al., 2020
<i>Theropithecus gelada</i>	AMNHM 80126	MorphoSource	0.09	M	-	S4065	Urciuoli et al., 2020
<i>Theropithecus gelada</i>	AMNHM 90309	MorphoSource	0.09	M	-	S4075	Urciuoli et al., 2020
<i>Trachypithecus cristatus</i>	MCZ 35567	MorphoSource	0.05	F	http://dx.doi.org/10.17602/M2/M4439	S1355	Urciuoli et al., 2020
<i>Trachypithecus cristatus</i>	MCZ 35584	MorphoSource	0.05	F	http://dx.doi.org/10.17602/M2/M4436	S1353	Urciuoli et al., 2020
<i>Trachypithecus cristatus</i>	MCZ 35586	MorphoSource	0.05	F	http://dx.doi.org/10.17602/M2/M4435	S1352	Urciuoli et al., 2020
<i>Trachypithecus cristatus</i>	MCZ 35597	MorphoSource	0.05	F	http://dx.doi.org/10.17602/M2/M4433	S1351	Urciuoli et al., 2020
<i>Trachypithecus cristatus</i>	MCZ 35603	MorphoSource	0.05	F	http://dx.doi.org/10.17602/M2/M4431	S1350	Urciuoli et al., 2020
<i>Oreopithecus bambolii</i>	BAC 208	NMB	0.03	?	pending	S45464	Urciuoli et al., 2020

<i>Australopithecus</i> sp.	StW 573	DNMNH	0.09	F	pending	S20126	Urciuoli et al., 2020
<i>Australopithecus</i> sp.	StW 578	DNMNH	0.07	?	pending	S20125	Urciuoli et al., 2020
<i>Nacholapithecus kerioi</i>	BG 42744	NMK	0.05	?	pending	S45493	This study
<i>Hispanopithecus laietanus</i>	IPS18000	CENIEH	0.03	?	pending	S32817	This study
<i>Rudapithecus hungaricus</i>	RUD 77R	MPIEV	0.01	F	pending	S32814	This study
<i>Rudapithecus hungaricus</i>	RUD 77L	MPIEV	0.01	F	pending	S32814	This study
<i>Rudapithecus hungaricus</i>	RUD 200	MPIEV	0.01	F	pending	S32816	This study

Table S4. Individual scores for all the principal components (bgPC) yielded by the between-group principal components analysis (bgPCA) of deformation-based 3DGM of vestibular shape for hominoids, using extant hominoid genera (i.e., *Homo*, *Gorilla*, *Pongo*, *Pan*, *Hylobates*, *Symphalangus*, and *Hoolock*) as grouping factor. The variance explained by each bgPC is reported within parentheses. Composition of the extant ($n = 77$) and fossil ($n = 8$) sample used for the analysis restricted to hominoid taxa.

ID	Taxon	bgPC1 (40.76%)	bgPC2 (33.74%)	bgPC3 (11.07%)	bgPC4 (8.5%)	bgPC5 (3.66%)	bgPC6 (2.27%)
StW573	<i>Australopithecus</i> sp.	1.3382732	-0.6634555	0.6212176	-0.3267709	0.2880409	-0.7897531
StW578	<i>Australopithecus</i> sp.	2.5763640	-1.6707594	-0.9761788	-0.1106569	0.0130315	-0.0855152
AMNHA999686	<i>Gorilla gorilla</i>	0.3137984	1.5395531	0.5476009	-1.1685954	0.3772195	-0.3420127
AMNHA999687	<i>Gorilla gorilla</i>	1.4569229	1.8336002	1.1308304	-1.1804031	0.5454415	-0.1286459
AMNHM167338	<i>Gorilla gorilla</i>	0.2726503	1.4155719	1.7905287	-1.1587084	-0.1816552	0.3381696
AMNHM54356	<i>Gorilla gorilla</i>	2.2663033	2.4482984	-0.7093243	-0.4792158	0.4292925	-0.5571369
ESFR50001994	<i>Gorilla gorilla</i>	1.4309570	1.6591508	-0.1699655	-1.0162740	0.3417946	-0.1622657
MCZ14750	<i>Gorilla gorilla</i>	0.5972012	2.0898448	1.3754468	-0.9625735	0.8538613	0.2444910
MCZ17684	<i>Gorilla gorilla</i>	-0.2344109	1.4640772	1.4447730	-1.5305631	0.2435803	-0.0169845
MCZ26850	<i>Gorilla gorilla</i>	1.5832453	1.5628506	1.2004216	-0.7940395	0.6535348	-0.1539377
MCZ37264	<i>Gorilla gorilla</i>	-0.4177107	1.5510936	1.9099210	-0.6656547	0.6288634	-0.1264012
MCZ37625	<i>Gorilla gorilla</i>	0.5801500	2.1427338	1.3400916	-0.9938100	0.8444579	0.2596263
MCZ49006	<i>Gorilla gorilla</i>	0.7030849	2.0788497	2.0123121	-0.5636038	0.3146633	-0.0797444
IPS18000	<i>Hispanopithecus laietanus</i>	1.8936129	-0.2719603	0.0411819	0.6268859	-0.0845936	0.3771966
EMBR121	<i>Homo sapiens</i>	1.8027346	-1.8085839	0.6070075	-0.6522354	0.6194173	-0.4809867
EMBR179	<i>Homo sapiens</i>	1.4650783	-3.0109084	-0.2586061	-0.2613913	0.0224463	0.3156086
EMBR212	<i>Homo sapiens</i>	2.3546135	-3.5844536	0.5211053	0.6460556	0.9045449	0.2465241
EMBR281	<i>Homo sapiens</i>	2.4830380	-3.0436689	-0.0800687	-0.5388172	0.4544495	-0.1842686
EMBR473	<i>Homo sapiens</i>	2.0893947	-3.3359158	-0.5027434	-0.0145984	0.1486939	-0.3173582
EMBR479	<i>Homo sapiens</i>	1.2494006	-2.0906183	0.5502618	-0.5851786	0.2333492	-0.2791741
EMBR583	<i>Homo sapiens</i>	1.9568233	-3.1148782	-0.4715052	-0.2888287	-0.2292497	0.0670015
F01	<i>Homo sapiens</i>	0.8925617	-2.5079848	0.0640081	-0.3641263	-0.1998405	0.2844841
F03	<i>Homo sapiens</i>	1.9459691	-3.4910926	-0.6573660	-0.5122909	0.0614192	-0.0413988
F04	<i>Homo sapiens</i>	0.9273597	-2.7668340	0.1332824	-0.1619039	-0.1646234	0.5419049
F05	<i>Homo sapiens</i>	2.1064765	-2.5466356	0.0036455	-0.2869690	0.3254311	-0.2639593

F06	<i>Homo sapiens</i>	2.4252385	-3.0222423	-0.5675022	-0.2450268	0.4642186	-0.4224578
AMNH201743	<i>Hoolock hoolock</i>	-1.5827514	-0.3761531	-0.3940247	-0.9472469	-1.2512374	-0.8348292
AMNHM112673	<i>Hoolock hoolock</i>	-1.8726856	-0.1598028	-0.4912032	-0.7345257	-0.4375065	-0.7603535
AMNHM112720	<i>Hoolock hoolock</i>	-1.9588243	-0.2875319	0.1935174	-0.4589063	-0.2223387	-0.7418477
AMNHM112983	<i>Hoolock hoolock</i>	-1.3656768	-0.2010666	-0.2860088	-1.0989523	-1.2589159	-1.0487105
AMNHM201742	<i>Hoolock hoolock</i>	-2.2283294	-0.0314326	0.0646998	-0.9394124	-0.8067232	-0.1960586
AMNHM83421	<i>Hoolock hoolock</i>	-1.4870402	-0.3487819	0.0420548	-1.1135738	-1.3618881	-1.0502255
AMNHM83425	<i>Hoolock hoolock</i>	-2.0876545	-1.0382619	-0.0656396	-0.9056551	-1.2467934	-0.3141687
AMNHM184598	<i>Hylobates lar</i>	-2.7998407	-0.2192540	-1.4737985	-0.3011830	0.5300182	-0.4166405
MCZ41411	<i>Hylobates lar</i>	-2.2250244	0.0002347	-0.7090184	0.6049438	0.9406985	-0.1187557
MCZ41412	<i>Hylobates lar</i>	-2.5266859	-0.4553475	-0.7905596	0.4252711	0.4995864	-0.4965751
MCZ41416	<i>Hylobates lar</i>	-3.6975970	-0.5139974	-0.3379045	0.6942158	0.8875791	0.0057917
MCZ41418	<i>Hylobates lar</i>	-3.1676492	-0.2029184	-0.0692441	0.2760012	0.5208797	-0.1671867
MCZ41421	<i>Hylobates lar</i>	-2.7757573	-0.4584324	-0.3267795	0.4557397	0.9461023	-0.2417524
MCZ41424	<i>Hylobates lar</i>	-2.3277271	-0.2637354	-0.9606589	0.2866966	1.0583153	-0.4359539
MCZ41452	<i>Hylobates lar</i>	-2.5470117	-0.1386758	-0.2696538	0.7369511	0.9803932	0.0686923
MCZ41455	<i>Hylobates lar</i>	-3.4504785	-0.5824691	-0.4703190	0.5072662	0.6112690	0.1155685
MCZ41469	<i>Hylobates lar</i>	-3.2409270	-0.1375783	0.6087417	0.6935175	0.8757233	0.1482708
BG42744	<i>Nacholapithecus kerioi</i>	-0.4642447	0.1359874	0.1076864	0.3255132	-0.3597446	0.0559937
BAC208	<i>Oreopithecus bambolii</i>	-0.2997381	0.0992835	-1.6603925	-1.0422202	-0.9970555	-0.1077210
AMNHM86857	<i>Pan paniscus</i>	0.6219677	0.0751903	1.0457679	0.7286966	-0.5199285	0.4155006
IPS9033	<i>Pan paniscus</i>	-0.0488700	-0.5035698	0.5699902	1.3347924	-0.0107562	0.5513203
MCZ38018	<i>Pan paniscus</i>	-0.4272007	0.3216974	0.6081783	0.5445969	-0.6332861	-0.0351403
MCZ38019	<i>Pan paniscus</i>	-0.1278585	0.5547184	0.3958990	0.5483718	-0.6500677	0.0403460
MCZ38020	<i>Pan paniscus</i>	1.4736445	0.4511601	0.3466141	0.7955150	-0.1223949	-0.4878229
ESFR50001988	<i>Pan sp.</i>	0.1798163	-0.2188625	0.0496762	0.7770419	-0.9321070	0.2670706
ESFR50001759	<i>Pan sp.</i>	0.7249979	0.2756223	0.7037410	0.2872531	-0.2327579	0.0274602
ESFR50001797	<i>Pan sp.</i>	0.8883331	0.5550743	0.4471127	1.0565885	-0.3216910	-0.6279794
ESFR50002604	<i>Pan sp.</i>	-0.1528878	0.4270550	0.2720372	1.2337790	-0.1295036	0.1708049
ESFR50001738	<i>Pan sp.</i>	0.0416432	0.2807808	1.0984640	0.7016937	-0.2966199	-0.0804702

ESFR50001754	<i>Pan sp.</i>	0.4607356	0.7827394	0.2403353	0.8727077	-0.2631552	-0.6415749
AMNHM167342	<i>Pan troglodytes</i>	0.7583596	0.4513930	0.5521876	1.2565171	0.0053606	-0.9014392
AMNHM167344	<i>Pan troglodytes</i>	0.2007911	-0.0976055	0.6292290	1.6630391	-0.0094563	0.1923988
AMNHM51204	<i>Pan troglodytes</i>	-0.0468513	1.2272948	0.5385163	0.6147403	-0.2509026	-0.4775304
ESFR50001793	<i>Pan troglodytes</i>	1.7287895	0.1397799	-0.2556778	1.0994647	-0.7619089	0.4469822
ESFR50001795	<i>Pan troglodytes</i>	0.8174869	0.9630190	0.0314446	0.8466524	-0.0789189	0.4357785
ESFR50001796	<i>Pan troglodytes</i>	2.1027219	0.5392616	-0.1731636	0.8772582	0.0235053	-0.0340047
ESFR50001799	<i>Pan troglodytes</i>	1.2512361	-0.0943425	0.0549321	0.6209725	-0.1257386	0.1548743
IPS5698	<i>Pan troglodytes</i>	0.0375824	0.4039856	-0.3606590	0.9928748	-0.3554733	-0.2075464
MCZ23167	<i>Pan troglodytes</i>	0.1064227	1.1707078	1.6035775	1.2783395	0.0196043	0.1684895
MCZ37260	<i>Pan troglodytes</i>	-0.0883370	1.0366506	0.7424941	1.3207423	0.0315792	0.0234912
MCZ46414	<i>Pan troglodytes</i>	-0.5454593	0.6858963	1.0035701	1.0256316	-0.3949361	0.7238880
MCZ46415	<i>Pan troglodytes</i>	0.6021587	0.3746121	0.0049062	1.0406770	0.0009213	0.1318657
ESRF50001801	<i>Pongo sp.</i>	2.0235351	1.9759838	-2.8626699	-0.8276244	-0.0814874	-0.1284787
IPS10647	<i>Pongo sp.</i>	2.6059094	1.1422423	-2.0399729	-0.0076384	-0.1448368	0.2994378
IPS10651	<i>Pongo sp.</i>	1.3771335	1.3794436	-2.8231520	-0.4959235	-0.1633515	0.1785825
IPS9031	<i>Pongo sp.</i>	1.0489164	2.4688540	-2.1901255	0.1525544	0.5469639	0.5177789
IPSSN	<i>Pongo sp.</i>	1.3275634	1.9492827	-1.3002212	-0.0324717	0.1108408	-0.2275310
MHNTZOO201108	<i>Pongo sp.</i>	1.4011301	1.9326695	-2.5913898	-0.0161196	-0.2795580	-0.0651892
SENCK1576	<i>Pongo sp.</i>	1.2013025	1.8433926	-1.7647592	0.1653941	-0.2196811	-0.0703733
SENCK6782	<i>Pongo sp.</i>	1.6381174	1.1397677	-1.0363457	-0.6856401	-0.0872838	0.3819519
RUD200	<i>Rudapithecus hungaricus</i>	0.4360545	0.0825615	-0.1778371	-0.7312362	-0.2272576	-0.1377664
RUD77L	<i>Rudapithecus hungaricus</i>	0.1943000	-0.4290993	-0.7934884	-0.7418348	-0.7369641	0.7086102
RUD77R	<i>Rudapithecus hungaricus</i>	0.2584431	-0.7458323	-0.5197980	-0.6046092	-0.9355201	0.9187386
AMNHM102724	<i>Symphalangus syndactylus</i>	-1.2378044	-1.3517852	-0.5378909	-0.6381418	-0.4315750	1.0004973
AMNHM106583	<i>Symphalangus syndactylus</i>	-2.1167431	0.5430253	0.0930548	-0.6285219	-0.2313290	0.6435202
EA258	<i>Symphalangus syndactylus</i>	-1.5619680	-0.4898104	0.3057531	-0.8624782	-0.5674299	1.4292011
ESFR50001912	<i>Symphalangus syndactylus</i>	-1.7267945	-0.1824883	0.1079608	-1.3928622	-0.5421532	0.7087465
MCZ36031	<i>Symphalangus syndactylus</i>	-2.7230455	-1.0591925	-0.1513939	-0.3936643	-0.5639739	1.5367528
MCZ36032	<i>Symphalangus syndactylus</i>	-2.7256941	-1.1402468	1.1636228	-0.2572034	-0.2929850	1.2819981

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