

Supplementary results

Table S1. Summary of species identity classification performance on the basis of either the perceptual dimensions of overall face pattern (eigenface scores), nose-spot appearance or eyebrow patch appearance. For each signal the performance of each individual component was calculated first, then up to two multicomponent models were calculated. The first ‘top predictors’ multicomponent model uses the three best performing components (highest % above chance classification performance). The second ‘all sig predictors’ multicomponent model includes all components that are significant predictors in the single component models. Percentage correct is the mean percentage of cross-validated cases classified correctly after 100 test iterations. The percentage chance column shows the mean percentage correct classification performance of 1000 random nested permutations of the test data.

		% correct	% chance	% above chance	<i>P</i>	
Eigenface scores 10 species, 99 individuals, 490 cases	eigenface 1	40.17	11.55	247.85	0.001	
	eigenface 2	38.34	11.63	229.61	0.001	
	eigenface 3	28.53	11.61	145.67	0.001	
	eigenface 4	35.12	11.63	201.86	0.001	
	eigenface 5	29.68	11.41	160.03	0.001	
	top predictors	eigenface 1, 2 & 4	77.19	13.60	467.47	0.001
	all sig predictors	eigenface 1-5	81.47	15.02	442.61	0.001
nose-spots 4 species, 47 individuals, 230 cases	shape PC1	40.40	27.22	48.45	0.095	
	shape PC2	40.72	26.82	51.84	0.078	
	shape PC3	56.11	27.42	104.61	0.004	
	shape PC4	32.70	26.73	22.36	0.231	
	shape PC5	46.35	27.55	68.23	0.015	
	R/G	63.03	28.66	119.90	0.001	
	B/Y	53.22	27.75	91.77	0.005	
	luminance	30.70	27.24	12.71	0.356	
	area	60.58	28.17	115.02	0.001	
	top predictors	R/G, B/Y, area	78.73	30.91	154.69	0.001
all sig predictors	shape PCs 2 & 5, R/G, B/Y, area	88.65	32.58	172.09	0.001	
eyebrow patches 4 species, 38 individuals, 188 cases	shape PC1	34.74	26.51	31.07	0.27	
	shape PC2	31.02	24.77	25.23	0.273	
	shape PC3	38.02	27.07	40.45	0.1	
	shape PC4	30.71	27.82	10.39	0.358	
	shape PC5	28.16	25.93	8.60	0.367	
	R/G	64.11	27.53	132.84	0.001	
	B/Y	51.34	27.83	84.49	0.011	
	luminance	24.80	27.62	-10.21	0.557	
	area	37.71	27.11	39.12	0.116	
	top predictors	shape PC3, R/G, B/Y	65.42	29.73	120.07	0.001
	all sig predictors	R/G, B/Y	64.84	28.08	130.87	0.001

Table S2. Sex identity classification performance from eigenface scores.

		% correct	% chance	% above chance	<i>P</i>
<i>C. ascanius</i>	eigenface 1	56.56	52.95	6.82	0.358
12 individuals, 56 cases	eigenface 2	38.88	54.50	-28.66	0.78
	eigenface 3	54.81	50.91	7.66	0.455
	eigenface 4	56.25	50.90	10.51	0.452
	eigenface 5	40.31	53.36	-24.45	0.742
	top predictors	eigenface 1, 3 & 4	42.67	63.28	-32.57
all sig predictors	none				
<i>C. mona</i>	eigenface 1	46.38	56.16	-17.41	0.736
13 individuals, 62 cases	eigenface 2	56.96	55.52	2.59	0.491
	eigenface 3	54.62	55.15	-0.96	0.484
	eigenface 4	51.69	51.23	0.90	0.493
	eigenface 5	48.58	54.74	-11.26	0.713
	top predictors	eigenface 2, 3 & 4	55.93	57.07	-2.01
all sig predictors	none				
<i>C. nictitans</i>	eigenface 1	52.42	52.31	0.21	0.496
18 individuals, 84 cases	eigenface 2	46.82	51.32	-8.77	0.634
	eigenface 3	62.04	52.85	17.41	0.249
	eigenface 4	49.98	51.44	-2.84	0.557
	eigenface 5	51.42	52.10	-1.31	0.522
	top predictors	eigenface 1 & 3	55.10	55.06	0.07
all sig predictors	none				

Table S3. Sex identity classification performance from nose-spots.

		% correct	% chance	% above chance	<i>P</i>	
<i>C. nictitans</i>	shape PC1	44.93	52.32	-14.13	0.745	
18 individuals, 84 cases	shape PC2	50.45	53.09	-4.97	0.553	
	shape PC3	43.02	50.32	-14.50	0.734	
	shape PC4	54.12	52.78	2.54	0.469	
	shape PC5	59.48	53.50	11.18	0.35	
	R/G	51.55	53.71	-4.02	0.595	
	B/Y	57.43	52.47	9.45	0.314	
	luminance	58.21	52.03	11.88	0.315	
	area	62.21	52.88	17.65	0.186	
	top predictors	shape PC5, luminance, area	61.38	55.61	10.37	0.34
	all sig predictors	none				

Table S4. Sex identity classification performance from eyebrow patches.

		% correct	% chance	% above chance	<i>P</i>
<i>C. mona</i>	shape PC1	52.89	52.69	0.39	0.547
13 individuals, 62 cases	shape PC2	62.86	50.61	24.21	0.183
	shape PC3	71.11	52.75	34.79	0.071
	shape PC4	53.57	52.04	2.94	0.527
	shape PC5	56.71	52.31	8.42	0.424
	R/G	58.50	54.21	7.91	0.373
	B/Y	61.21	55.30	10.69	0.303
	luminance	48.89	52.80	-7.40	0.631
	area	43.75	54.87	-20.27	0.774
	top predictors	shape PCs 2 & 3, B/Y	62.71	55.91	12.17
all sig predictors	none				

Table S5. Age identity classification performance from eigenface scores.

		% correct	% chance	% above chance	<i>P</i>
<i>C. mona</i>	eigenface 1	40.36	53.69	-24.83	0.766
13 individuals, 62 cases	eigenface 2	41.48	53.47	-22.41	0.798
	eigenface 3	72.21	52.89	36.52	0.103
	eigenface 4	64.73	50.94	27.06	0.126
	eigenface 5	56.27	52.20	7.80	0.411
	top predictors	eigenface 3, 4 & 5	68.64	54.98	24.84
	all sig predictors	none			
<i>C. nictitans</i>	eigenface 1	61.72	53.35	15.70	0.187
18 individuals, 84 cases	eigenface 2	54.31	51.40	5.64	0.382
	eigenface 3	72.50	54.24	33.65	0.076
	eigenface 4	47.36	52.63	-10.00	0.647
	eigenface 5	52.69	53.50	-1.50	0.575
	top predictors	eigenface 1, 2 & 3	70.97	55.54	27.78
	all sig predictors	none			

Table S6. Age identity classification performance from nose-spots.

		% correct	% chance	% above chance	<i>P</i>	
<i>C. nictitans</i>	shape PC1	49.97	51.96	-3.83	0.634	
18 individuals, 84 cases	shape PC2	45.72	54.07	-15.44	0.758	
	shape PC3	47.72	50.91	-6.26	0.612	
	shape PC4	50.78	53.43	-4.97	0.586	
	shape PC5	67.78	53.40	26.92	0.086	
	R/G	57.75	53.64	7.65	0.392	
	B/Y	49.81	54.14	-8.01	0.679	
	luminance	52.28	51.79	0.94	0.502	
	area	52.19	53.68	-2.77	0.58	
	top predictors	shape PC5, R/G, luminance	63.42	57.10	11.06	0.308
		all sig predictors	none			

Table S7. Age identity classification performance from eyebrows.

		% correct	% chance	% above chance	<i>P</i>	
<i>C. mona</i>	shape PC1	47.15	52.40	-10.02	0.576	
13 individuals, 62 cases	shape PC2	53.59	50.17	6.82	0.4	
	shape PC3	60.29	52.41	15.04	0.315	
	shape PC4	50.44	52.12	-3.21	0.521	
	shape PC5	39.65	51.29	-22.70	0.733	
	R/G	67.15	53.22	26.17	0.172	
	B/Y	67.21	54.19	24.01	0.203	
	luminance	62.50	52.64	18.73	0.194	
	area	48.79	52.29	-6.68	0.605	
	top predictors	R/G, B/Y, luminance	64.88	56.84	14.15	0.251
		all sig predictors	none			

Table S8. Individual identity classification performance from eigenface scores.

		% correct	% chance	% above chance	<i>P</i>
<i>A. nigroviridis</i>	eigenface 1	48.70	14.27	241.31	0.004
7 individuals, 45 cases	eigenface 2	46.80	13.90	236.77	0.007
	eigenface 3	49.30	14.78	233.57	0.01
	eigenface 4	57.70	13.79	318.49	0.003
	eigenface 5	60.80	13.98	334.88	0.001
top predictors	eigenface 1, 4 & 5	92.80	14.89	523.12	0.001
all sig predictors	eigenface 1 - 5	95.20	14.17	572.07	0.001
<i>C. ascanius</i>	eigenface 1	25.13	8.45	197.33	0.026
7 individuals, 36 cases	eigenface 2	25.63	8.08	217.31	0.019
	eigenface 3	5.13	7.86	-34.76	0.481
	eigenface 4	10.88	7.95	36.82	0.493
	eigenface 5	20.00	8.66	131.01	0.153
top predictors	eigenface 1, 2 & 5	53.88	8.65	522.55	0.001
all sig predictors	eigenface 1 & 2	47.50	8.40	465.64	0.003
<i>C. diana</i>	eigenface 1	6.00	24.79	-75.80	0.701
4 individuals, 26 cases	eigenface 2	7.00	23.86	-70.66	0.683
	eigenface 3	8.83	24.71	-64.25	0.673
	eigenface 4	68.17	25.05	172.11	0.027
	eigenface 5	33.67	24.70	36.30	0.22
top predictors	eigenface 4 & 5	61.00	24.64	147.52	0.053
all sig predictors	eigenface 4	68.17	25.05	172.11	0.027
<i>C. mitis</i>	eigenface 1	92.83	34.71	167.46	0.007
3 individuals, 30 cases	eigenface 2	64.67	32.20	100.84	0.204
	eigenface 1 & 2	100.00	33.45	198.95	0.009
	eigenface 1	92.83	34.71	167.46	0.007
<i>C. mona</i>	eigenface 1	31.47	8.04	291.14	0.004
13 individuals, 62 cases	eigenface 2	19.67	7.83	151.29	0.095
	eigenface 3	19.47	7.88	147.06	0.101
	eigenface 4	14.00	7.31	91.41	0.086
	eigenface 5	20.40	7.71	164.46	0.011
top predictors	eigenface 1, 2 & 5	42.13	7.90	433.64	0.001
all sig predictors	eigenface 1 & 5	35.67	8.28	330.64	0.001
<i>C. neglectus</i>	eigenface 1	8.00	24.96	-67.95	0.439
4 individuals, 22 cases	eigenface 2	50.00	25.55	95.69	0.448
	eigenface 3	71.50	23.72	201.41	0.043
	eigenface 4	55.50	24.41	127.41	0.05
	eigenface 5	50.50	24.05	109.97	0.047
top predictors	eigenface 3, 4 & 5	75.00	23.88	214.14	0.047
all sig predictors	eigenface 3, 4 & 5	75.00	23.88	214.14	0.047
<i>C. nictitans</i>	eigenface 1	15.13	6.82	121.73	0.092
11 individuals, 60 cases	eigenface 2	3.94	6.95	-43.38	0.701
	eigenface 3	15.81	6.62	139.01	0.083
	eigenface 4	9.94	6.48	53.39	0.283
	eigenface 5	14.06	6.23	125.62	0.06
top predictors	eigenface 1, 3 & 5	31.31	6.51	60.83	0.001
all sig predictors	eigenface 1, 3 & 5	31.31	6.51	60.83	0.001

Table S8 continued.

		% correct	% chance	% above chance	<i>P</i>
<i>C. petaurista</i>	eigenface 1	75.71	24.36	210.80	0.009
4 individuals, 27 cases	eigenface 2	83.29	24.87	234.90	0.01
	eigenface 3	16.00	24.52	-34.74	0.499
	eigenface 4	31.14	25.05	24.35	0.318
	eigenface 5	37.71	24.37	54.78	0.279
	top predictors	eigenface 1, 2 & 5	96.29	26.34	265.56
all sig predictors	eigenface 1 & 2	88.14	24.53	259.31	0.001
<i>C. sclateri</i>	eigenface 1	59.89	16.57	261.41	0.004
6 individuals, 39 cases	eigenface 2	32.89	16.52	99.06	0.18
	eigenface 3	67.44	16.50	308.73	0.001
	eigenface 4	38.78	16.15	140.11	0.048
	eigenface 5	42.33	16.86	151.02	0.055
	top predictors	eigenface 1, 3 & 5	76.67	16.79	356.68
all sig predictors	eigenface 1, 3 & 4	71.44	17.40	310.49	0.001
<i>C. wolfi</i>	eigenface 1	56.75	16.03	253.99	0.034
6 individuals, 34 cases	eigenface 2	59.25	16.71	254.59	0.026
	eigenface 3	86.25	15.76	447.23	0.002
	eigenface 4	30.00	17.43	72.12	0.166
	eigenface 5	21.00	17.15	22.48	0.502
	top predictors	eigenface 1, 2 & 3	100.00	15.60	541.03
all sig predictors	eigenface 1, 2 & 3	100.00	15.60	541.03	0.001
<i>E. patas</i>	eigenface 1	68.50	32.32	111.95	0.148
3 individuals, 17 cases	eigenface 2	98.50	34.70	183.87	0.156
	eigenface 3	100.00	31.15	221.03	0.118
	top predictors	eigenface 1, 2 & 3	100.00	35.05	185.31
all sig predictors	none				

Table S9. Individual identity classification performance from nose-spots.

		% correct	% chance	% above chance	<i>P</i>	
<i>C. ascanius</i>	shape PC1	19.00	8.19	131.88	0.135	
7 individuals, 36 cases	shape PC2	11.25	8.82	27.50	0.512	
	shape PC3	3.38	8.10	-58.35	0.482	
	shape PC4	13.63	8.25	65.13	0.132	
	shape PC5	14.13	7.84	80.19	0.121	
	R/G	34.25	8.26	314.69	0.016	
	B/Y	11.50	8.15	41.12	0.498	
	luminance	14.88	7.85	89.43	0.129	
	area	17.75	8.27	114.69	0.129	
	top predictors	shape PC 1, R/G, area	52.00	15.25	240.94	0.153
	all sig predictors	R/G	34.25	8.26	314.69	0.016
<i>C. nictitans</i>	shape PC1	10.00	9.21	8.58	0.383	
11 individuals, 60 cases	shape PC2	16.00	9.60	66.74	0.393	
	shape PC3	9.80	8.83	10.99	0.374	
	shape PC4	11.40	9.17	24.30	0.376	
	shape PC5	31.20	9.59	225.30	0.046	
	R/G	12.60	9.15	37.67	0.388	
	B/Y	5.40	9.33	-42.09	0.382	
	luminance	7.00	8.95	-21.76	0.378	
	area	21.40	9.32	129.58	0.048	
	top predictors	shape PCs 2 & 5, area	35.00	8.76	299.77	0.06
	all sig predictors	shape PC5, area	39.40	9.30	225.30	0.035
<i>C. petaurista</i>	shape PC1	45.43	24.27	87.15	0.106	
4 individuals, 27 cases	shape PC2	87.86	25.33	246.84	0.001	
	shape PC3	39.00	24.71	57.83	0.254	
	shape PC4	69.86	24.43	185.98	0.038	
	shape PC5	50.71	24.18	109.74	0.125	
	R/G	55.71	25.43	119.11	0.157	
	B/Y	23.57	24.78	-4.88	0.508	
	luminance	28.43	24.51	15.97	0.512	
	area	31.86	25.66	24.15	0.315	
	top predictors	shape PCs 2 & 4, R/G	100.00	25.06	299.09	0.001
	all sig predictors	shape PCs 2 & 4	85.57	25.09	241.12	0.004
<i>C. sclateri</i>	shape PC1	17.20	19.90	-13.56	0.7	
5 individuals, 30 cases	shape PC2	37.25	20.06	85.67	0.177	
	shape PC3	16.40	20.66	-20.61	0.713	
	shape PC4	9.60	20.11	-52.26	0.707	
	shape PC5	22.00	20.62	6.68	0.262	
	R/G	51.60	19.51	164.46	0.049	
	B/Y	64.00	19.50	228.14	0.006	
	luminance	10.80	20.83	-48.15	0.691	
	area	24.20	20.02	20.85	0.266	
	top predictors	shape PC 2, R/G, B/Y	63.50	18.06	251.54	0.009
	all sig predictors	R/G, B/Y	63.60	20.68	207.49	0.011

Table S10. Individual identity classification performance from eyebrow patches.

		% correct	% chance	% above chance	<i>P</i>
<i>C. diana</i>	shape PC1	20.17	26.04	-22.55	0.448
4 individuals, 26 cases	shape PC2	37.17	25.14	47.86	0.244
	shape PC3	2.67	23.79	-88.79	0.519
	shape PC4	23.33	25.66	-9.06	0.434
	shape PC5	20.33	25.95	-21.66	0.463
	R/G	21.00	24.74	-15.11	0.416
	B/Y	27.83	24.39	14.10	0.416
	luminance	89.00	24.46	263.92	0.002
	area	32.50	23.83	36.37	0.412
top predictors	shape PCs 2 & 5, luminance	60.67	23.89	153.94	0.063
all sig predictors	luminance	89.00	24.46	263.92	0.002
<i>C. mona</i>	shape PC1	14.69	7.80	88.25	0.120
12 individuals, 64 cases	shape PC2	15.50	7.59	104.20	0.105
	shape PC3	14.19	7.57	87.41	0.104
	shape PC4	10.88	7.50	44.91	0.331
	shape PC5	12.88	8.14	58.21	0.136
	R/G	17.44	7.39	135.88	0.095
	B/Y	23.19	7.54	207.70	0.026
	luminance	16.75	7.43	125.46	0.095
	area	15.88	7.55	110.17	0.112
top predictors	shape PCs 1 & 5, B/Y	58.25	9.13	537.78	0.003
all sig predictors	B/Y	23.19	7.54	207.70	0.026
<i>C. neglectus</i>	shape PC1	42.50	24.94	70.39	0.441
4 individuals, 22 cases	shape PC2	25.00	22.68	10.25	0.416
	shape PC3	50.50	25.30	99.60	0.055
	shape PC4	70.50	24.57	186.93	0.057
	shape PC5	37.50	26.39	42.11	0.466
	R/G	53.50	24.30	120.13	0.046
	B/Y	57.50	24.91	130.85	0.049
	luminance	26.00	24.63	5.58	0.441
	area	58.50	23.56	148.32	0.042
top predictors	R/G, B/Y, area	67.50	24.02	181.05	0.049
all sig predictors	R/G, B/Y, area	60.00	24.26	147.32	0.044
<i>C. wolfi</i>	shape PC1	8.00	16.38	-51.17	0.448
6 individuals, 34 cases	shape PC2	9.25	16.43	-43.72	0.412
	shape PC3	26.25	16.95	54.86	0.156
	shape PC4	17.75	16.82	5.54	0.495
	shape PC5	30.50	17.33	75.99	0.147
	R/G	51.50	16.88	205.16	0.032
	B/Y	42.50	16.72	154.22	0.157
	luminance	53.00	16.38	223.60	0.024
	area	10.00	16.71	-40.16	0.464
top predictors	shape PC1, R/G, luminance	53.25	17.05	212.26	0.023
all sig predictors	R/G, luminance	63.00	16.38	284.66	0.014