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APPENDIX I

Table A1.1. Interlandmark distance abbreviations and landmarks involved.

Abbreviation	Landmark 1	Landmark number	Landmark 2	Landmark number
GOL	glabella	23	opisthocranium	42
XCB	left eurion	40	right eurion	41
ZYB	left zygion	16	right zygion	17
BBH	basion	27	bregma	24
BNL	basion	27	nasion	22
ASB	left asterion	32	right asterion	33
WFB	left frontotemporale	19	right frontotemporale	20
UFBR	left frontomolare temporale	18	right frontomolare temporale	21
NLHL	nasion	22	left most inferior nasal border	2
NLHR	nasion	22	right most inferior nasal border	3
NLH	average of NLHL and NLHR			
NLB	left alare	4	right alare	5
OBBL	left dacryon	10	left ectoconchion	11
OBBR	right dacryon	12	right ectoconchion	13
OBHL	left lower orbital border	8	left upper orbital border	9
OBHR	right lower orbital border	14	right upper orbital border	15
EKB	left ectoconchion	11	right ectoconchion	13
DKB	left dacryon	10	right dacryon	12
FRC	nasion	22	bregma	24
PAC	bregma	24	lambda	25
OCC	lambda	25	opisthion	26
FOL	opisthion	26	basion	27
FOB	left border of foramen magnum (FOB point)	28	right border of foramen magnum (FOB point)	29
MDHL	left porion	35	left mastoidale	36
MDHR	right porion	38	right mastoidale	39
AUB	left radiculare	30	right radiculare	31
NOL	nasion	22	opisthocranium	42
MOW	left zygoorbitale	6	right zygoorbitale	7
NLH2	nasion	22	supspinale	1
MAPL	left mid-malar projection point	34	left porion	35
MAPR	right mid-malar projection point	37	right porion	38
MAP2L	left mid-malar projection point	34	left ectoconchion	11
MAP2R	right mid-malar projection point	37	right ectoconchion	13
MAP3L	left mid-malar projection point	34	left asterion	32
MAP3R	right mid-malar projection point	37	right asterion	33

APPENDIX II

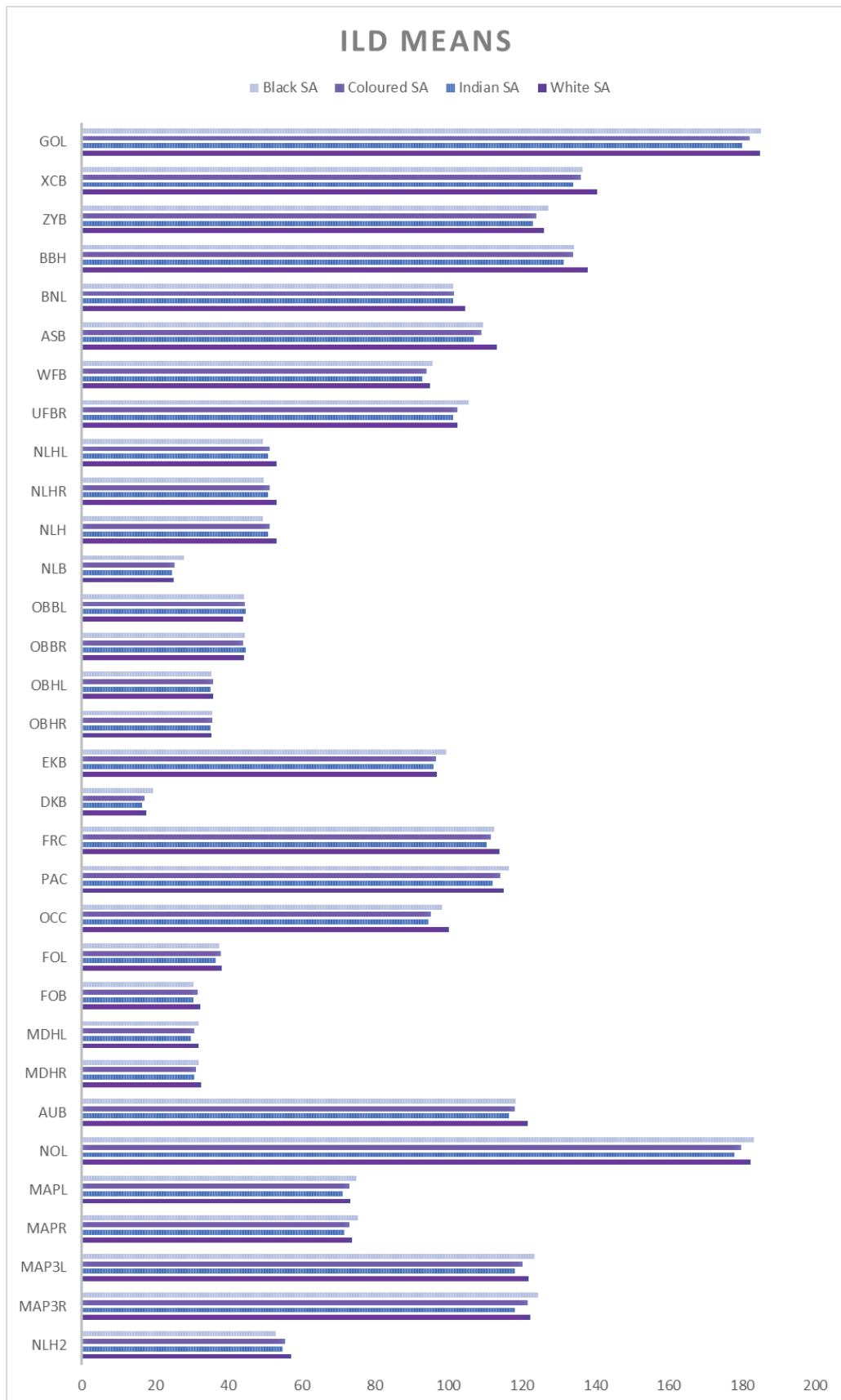


Figure A2.1. Bar chart depicting the means for black, coloured, Indian and white South Africans for each of the ILDs.

APPENDIX III

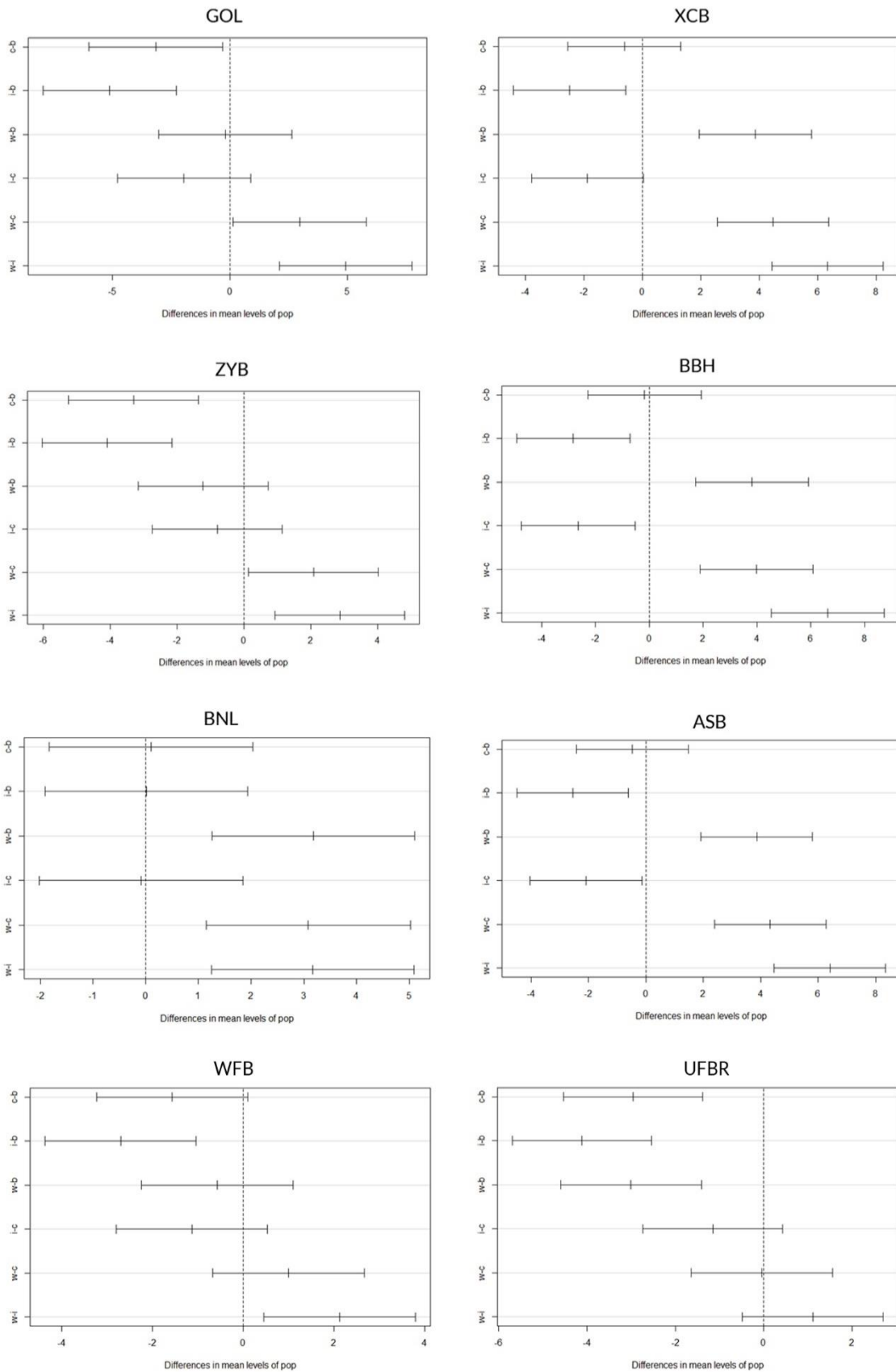


Figure A3.1. Tukey's HSD plots for GOL, XCB, ZYB, BBH, BNL, ASB, WFB, and UFBR depicting significant group differences or overlap.

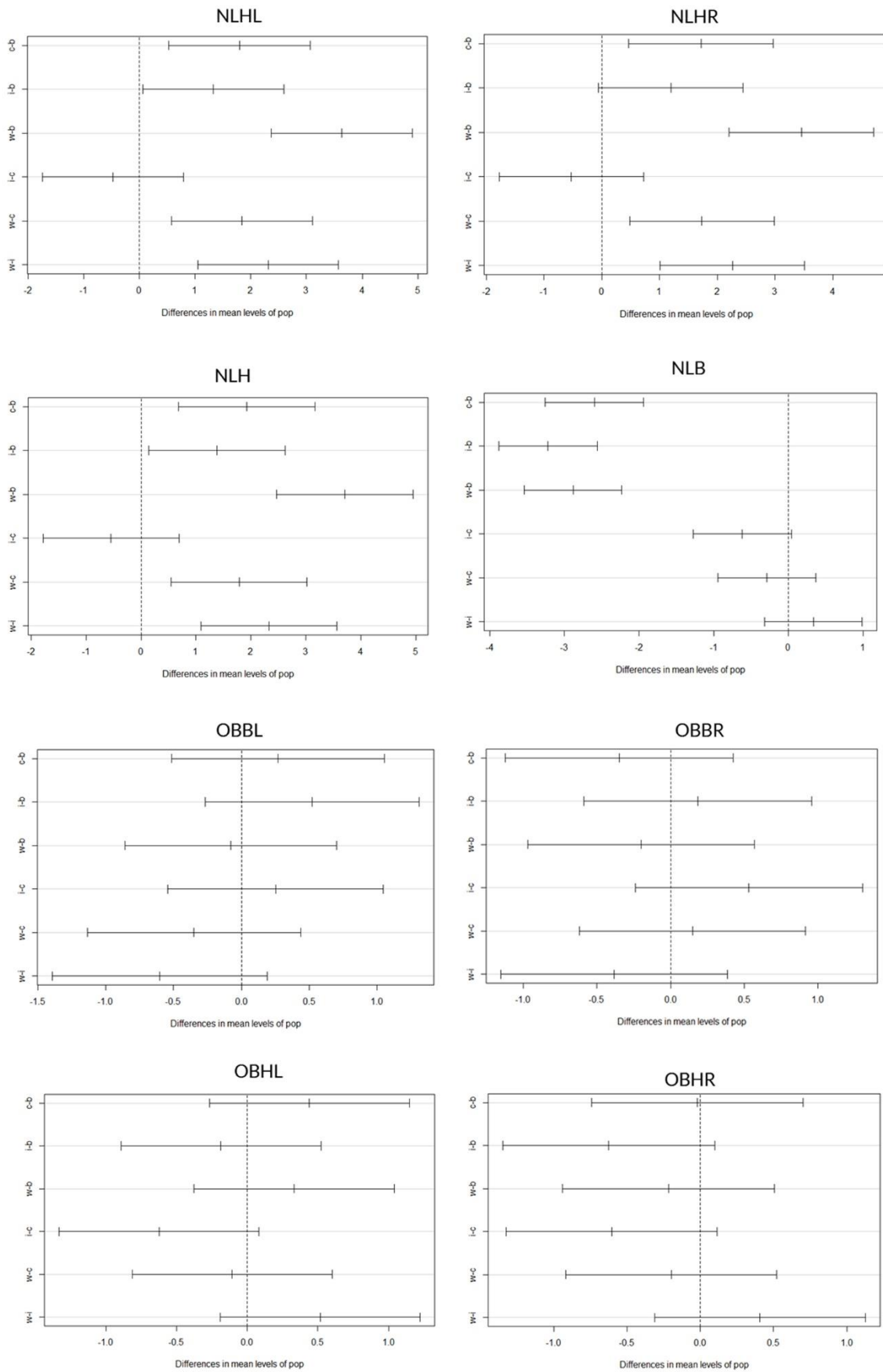


Figure A3.2. Tukey's HSD plots for NLHL, NLHR, NLH, NLB, OBBL, OBBL, OBHL and OBHR depicting significant group differences or overlap.

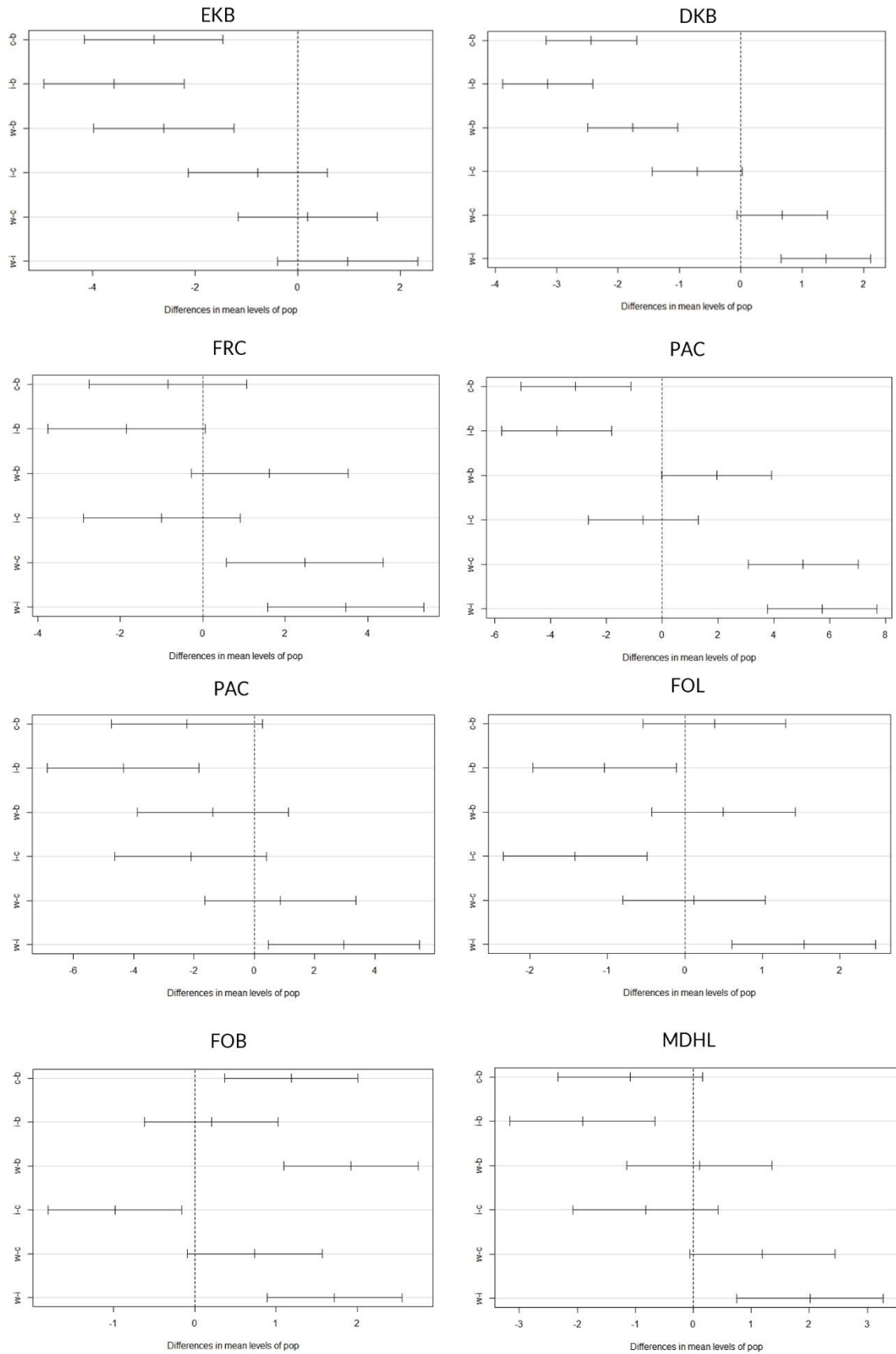


Figure A3.3. Tukey's HSD plots for DKB, EKB, FRC, OCC, PAC, FOL, FOB, and MDHL depicting significant group differences or overlap.

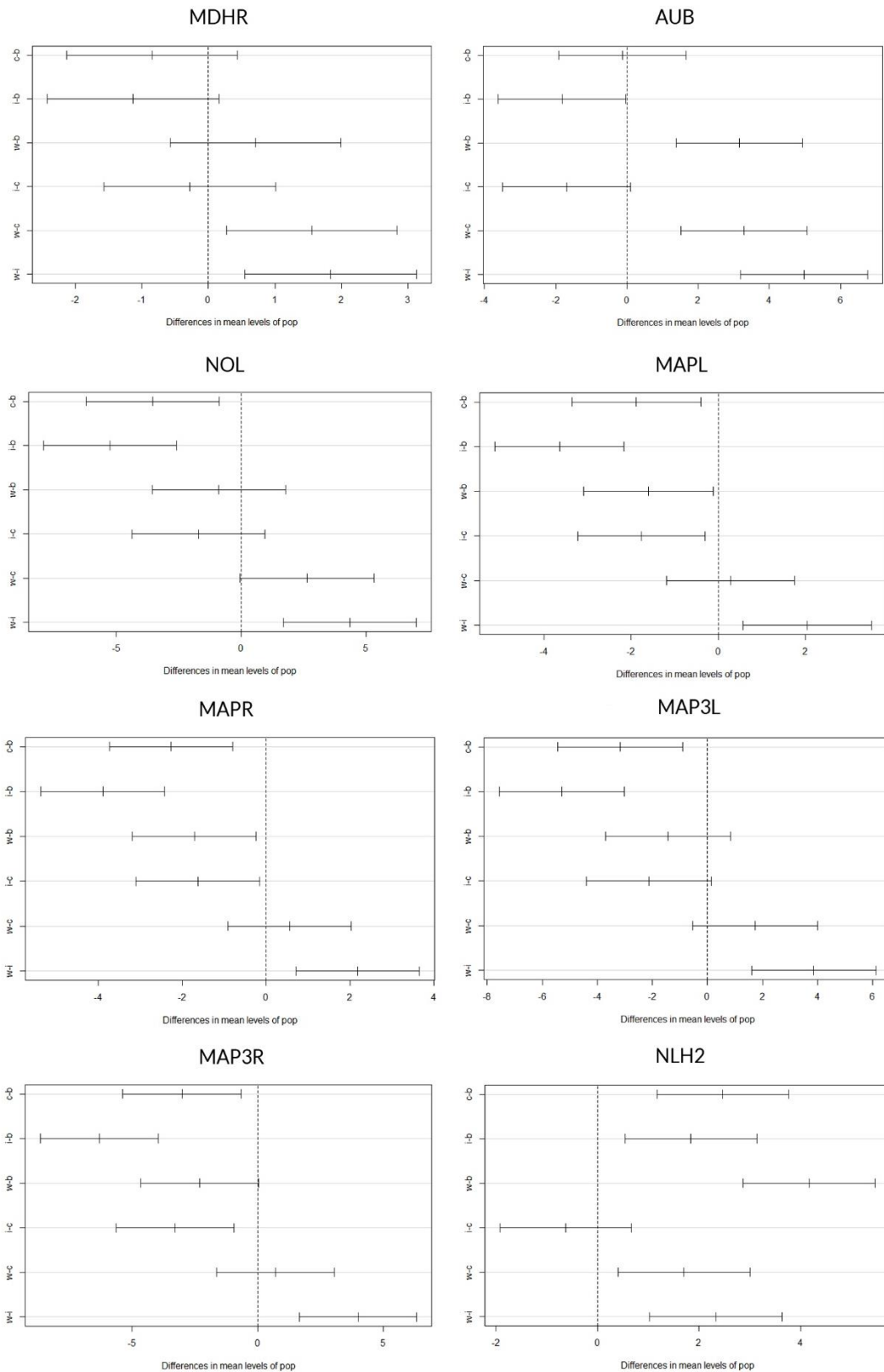


Figure A3.4. Tukey's HSD plots for MDHR, AUB, NOL, MAPL, MAPR, MAP3L, MAP3R, AND NLH2 depicting significant group differences or overlap.

APPENDIX IV

Table A4.1. Relative variable importance (GS Imp %) and ILDs selected for model creation in FD3 for the estimation of population affinity (sexes pooled and separate), PopSex, and sex. Variables are sorted from largest to smallest GS Imp%.

Population Affinity (pooled sexes)		Population Affinity (females only)		Population Affinity (males only)		PopSex		Sex	
ILDs	GS Imp %	ILD	GS Imp %	ILD	GS Imp %	ILD	GS Imp %	ILD	GS Imp %
NLB	15.5	NLB	10.9	NLB	10.9	ZYB	7.7	GOL	26.0
DKB	11.5	DKB	9.7	DKB	7.4	BNL	7.4	NOL	25.6
UFBR	7.1	MAP3R	8.5	BBH	6.8	BBH	7.0	ZYB	9.4
MAP3R	6.6	NLH2	7.9	ZYB	5.7	MAP3R	6.8	BNL	6.3
NLH2	5.5	MAPR	6.0	MAP3L	5.4	MAP3L	6.5	AUB	5.1
ZYB	5.5	UFBR	5.7	XCB	5.1	NLH2	6.3	MAP3R	3.5
XCB	4.8	EKB	5.5	ASB	4.8	MDH	5.7	MDH	3.3
ASB	4.8	BBH	5.1	UFBR	4.8	AUB	5.6	BBH	2.8
MAPL	4.7	MAPL	5.0	EKB	4.6	XCB	5.0	FRC	2.7
BBH	3.9	NOL	4.5	FOB	4.6	FRC	4.6	MAP3L	2.4
NOL	3.8	GOL	4.3	AUB	4.2	FOB	4.5	NLH2	2.2
OCC	3.8	OCC	4.0	MAP3R	4.2	MAPL	4.3	MAPR	1.7
AUB	3.6	ASB	3.8	NLHL	4.1	UFBR	4.2	FOL	1.6
FOB	3.5	XCB	3.7	NLH	3.9	EKB	4.1	PAC	1.6
GOL	3.4	PAC	2.8	BNL	3.5	NLB	4.0	UFBR	1.6
MDH	2.7	BNL	2.7	FRC	3.4	MAPR	3.8	MAPL	1.6
PAC	2.6	FOB	2.7	GOL	3.2	ASB	3.4	XCB	1.2
MDHR	1.8	OBB	2.4	NOL	3.1	DKB	3.1	FOB	1.1
BNL	1.7	OBBR	1.8	OCC	2.7	OBB	2.1	ASB	0.4
FRC	1.4	FRC	1.7	MAPL	2.4	OCC	1.9	NLB	0.2
OBHR	0.6	OBHR	1.0	MDHR	1.7	OBBR	1.6	OCC	0.1
OBB	0.5	OBHL	0.5	FOL	1.3	OBHR	0.5		
OBHL	0.4			PAC	1.2				
OBBR	0.2			OBBR	0.9				
				OBHL	0.3				
				OBHR	0.1				

APPENDIX V

Table A5.1. Intra- and inter-observer error represented by Euclidean distances to show the dispersion of repeated landmark placements.

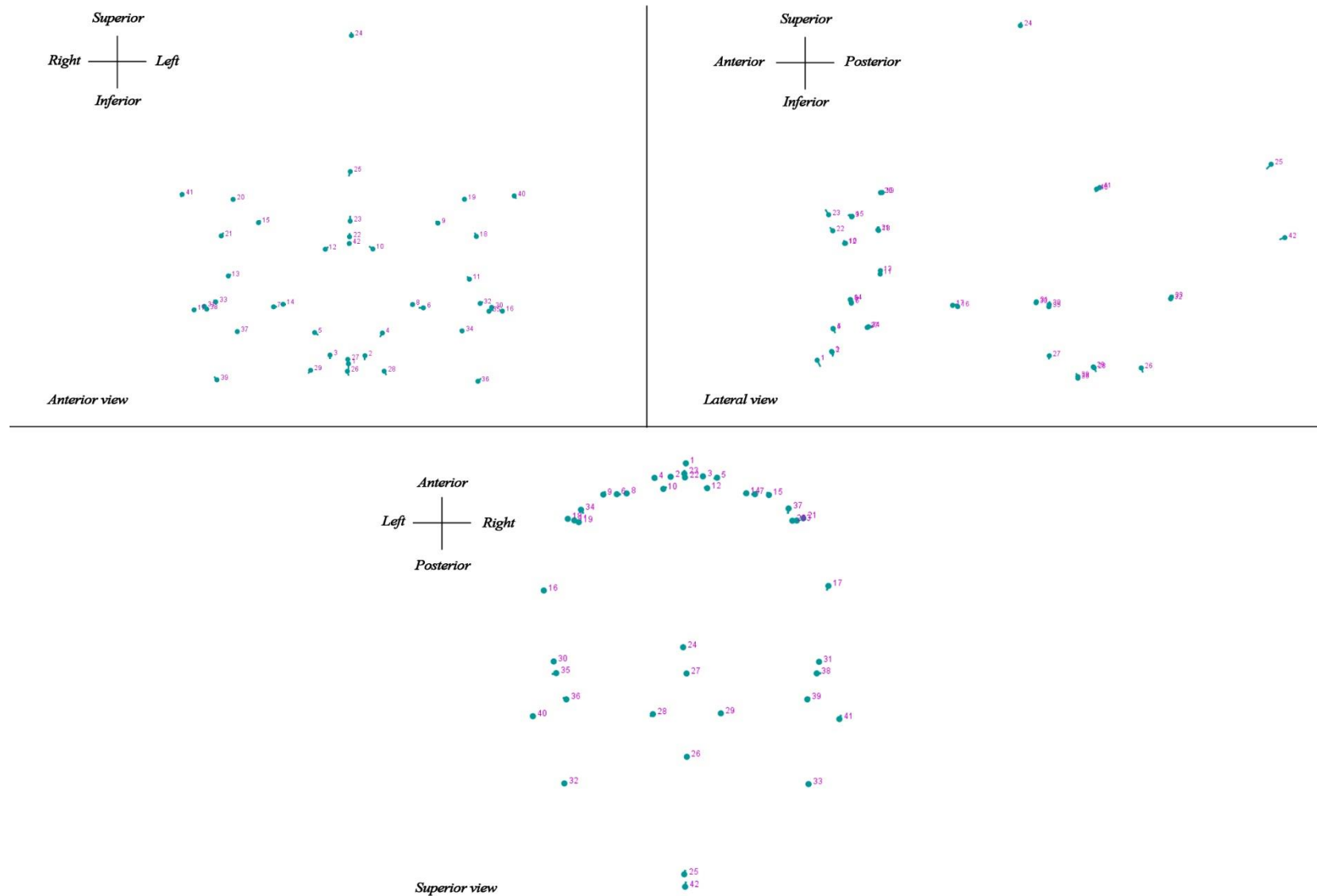
Landmark number and name	Intra-observer Error		Inter-observer Error	
	Euclidean distance (mm)	SD	Euclidean distance (mm)	SD
1. subspinale	0.23	0.10	0.45	0.20
2. most inferior nasal border (L)	0.57	0.30	0.71	0.38
3. most inferior nasal border (R)	0.45	0.31	0.56	0.29
4. alare (L)	0.50	0.31	0.66	0.40
5. alare (R)	0.41	0.25	0.41	0.21
6. zygoorbitale (L)	0.57	0.86	1.78	1.42
7. zygoorbitale (R)	0.43	0.32	1.27	0.85
8. lower orbital border (L)	0.47	0.40	2.02	1.04
9. upper orbital border (L)	0.58	0.49	1.40	0.84
10. dacryon (L)	0.74	0.44	0.90	0.53
11. ectoconchion (L)	0.73	0.65	2.03	4.60
12. dacryon (R)	0.47	0.36	0.63	0.51
13. ectoconchion (R)	0.71	0.50	0.75	0.53
14. lower orbital border (R)	0.43	0.30	2.13	1.28
15. upper orbital border (R)	0.34	0.27	0.93	0.58
16. zygion (L)	0.75	0.39	1.32	0.71
17. zygion (R)	0.82	0.60	1.31	0.82
18. frontomalare temporale (L)	0.33	0.19	0.84	0.34
19. frontotemporale (L)	0.74	0.37	1.17	0.73
20. frontotemporale (R)	0.50	0.48	1.00	0.84
21. frontomalare temporale (R)	0.51	0.16	1.12	0.66
22. nasion	0.25	0.10	0.46	0.41
23. glabella	0.52	0.33	0.65	0.26
24. bregma	0.39	0.25	0.54	0.47
25. lambda	0.43	0.17	0.55	0.37
26. opisthion	0.20	0.12	0.43	0.25
27. basion	0.21	0.15	0.69	0.37
28. FOB point (L)	0.44	0.31	1.00	1.04
29. FOB point (R)	0.55	0.35	1.33	0.89
30. radiculare (L)	0.81	0.46	0.88	0.65
31. radiculare (R)	0.66	0.48	0.81	0.60
32. asterion (L)	0.95	0.67	0.85	0.67
33. asterion (R)	0.88	0.60	0.80	0.51
34. mid malar projection point (L)	0.77	0.35	1.34	0.81
35. porion (L)	0.53	0.50	0.96	0.66
36. mastoidale (L)	0.41	0.26	0.74	0.59
37. mid malar projection point (R)	0.63	0.23	1.12	0.69
38. porion (R)	0.75	0.62	0.79	0.48
39. mastoidale (R)	0.48	0.25	0.94	0.84
40. eurion (L)	0.77	0.56	1.82	1.12
41. eurion (R)	1.08	0.41	1.71	0.92
42. opisthocranion	0.67	0.33	1.23	0.55
Mean	0.56	0.37	1.02	0.74

APPENDIX VI

Table A6.1. PC scores. Eigenvalues. % variance and the cumulative variance expressed by the PC scores.

PC score	Eigenvalues	% Variance	Cumulative %
PC1	0.00077990	20.112	20.112
PC2	0.00028424	7.330	27.441
PC3	0.00024504	6.319	33.760
PC4	0.00021742	5.607	39.367
PC5	0.00019371	4.995	44.362
PC6	0.00017094	4.408	48.770
PC7	0.00014137	3.646	52.416
PC8	0.00011840	3.053	55.469
PC9	0.00011262	2.904	58.373
PC10	0.00010491	2.705	61.078
PC11	0.00010140	2.615	63.693
PC12	0.00008714	2.247	65.941
PC13	0.00007775	2.005	67.946
PC14	0.00007053	1.819	69.764
PC15	0.00006434	1.659	71.424
PC16	0.00006393	1.649	73.072
PC17	0.00006196	1.598	74.670
PC18	0.00005154	1.329	75.999
PC19	0.00005014	1.293	77.292
PC20	0.00004366	1.126	78.418
PC21	0.00004260	1.099	79.517
PC22	0.00004058	1.047	80.563

Shape differences between black and coloured South Africans



APPENDIX VII

Figure A7.1. Lollipop graphs illustrating the shape differences between black and coloured South Africans in anterior (top left), lateral (top right), and superior (bottom) view. The dot indicates the black mean shape, while the line (lollipop stick) indicates the coloured mean shape.

Shape differences between black and Indian South Africans

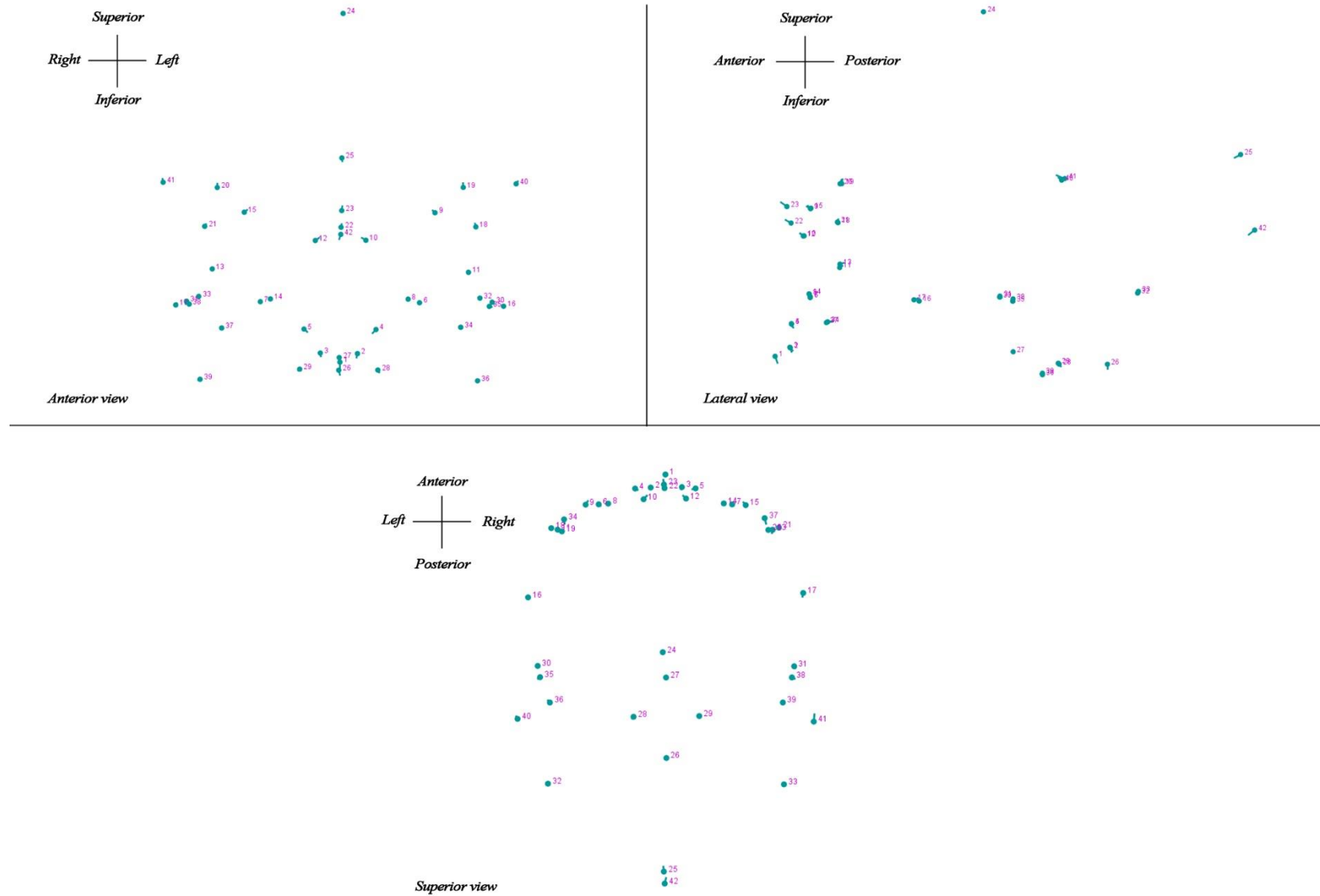


Figure A7.2. Lollipop graphs illustrating the shape differences between black and Indian South Africans in anterior (top left), lateral (top right), and superior (bottom) view. The dot indicates the black mean shape, while the line (lollipop stick) indicates the Indian mean shape.

Shape differences between Indian and white South Africans

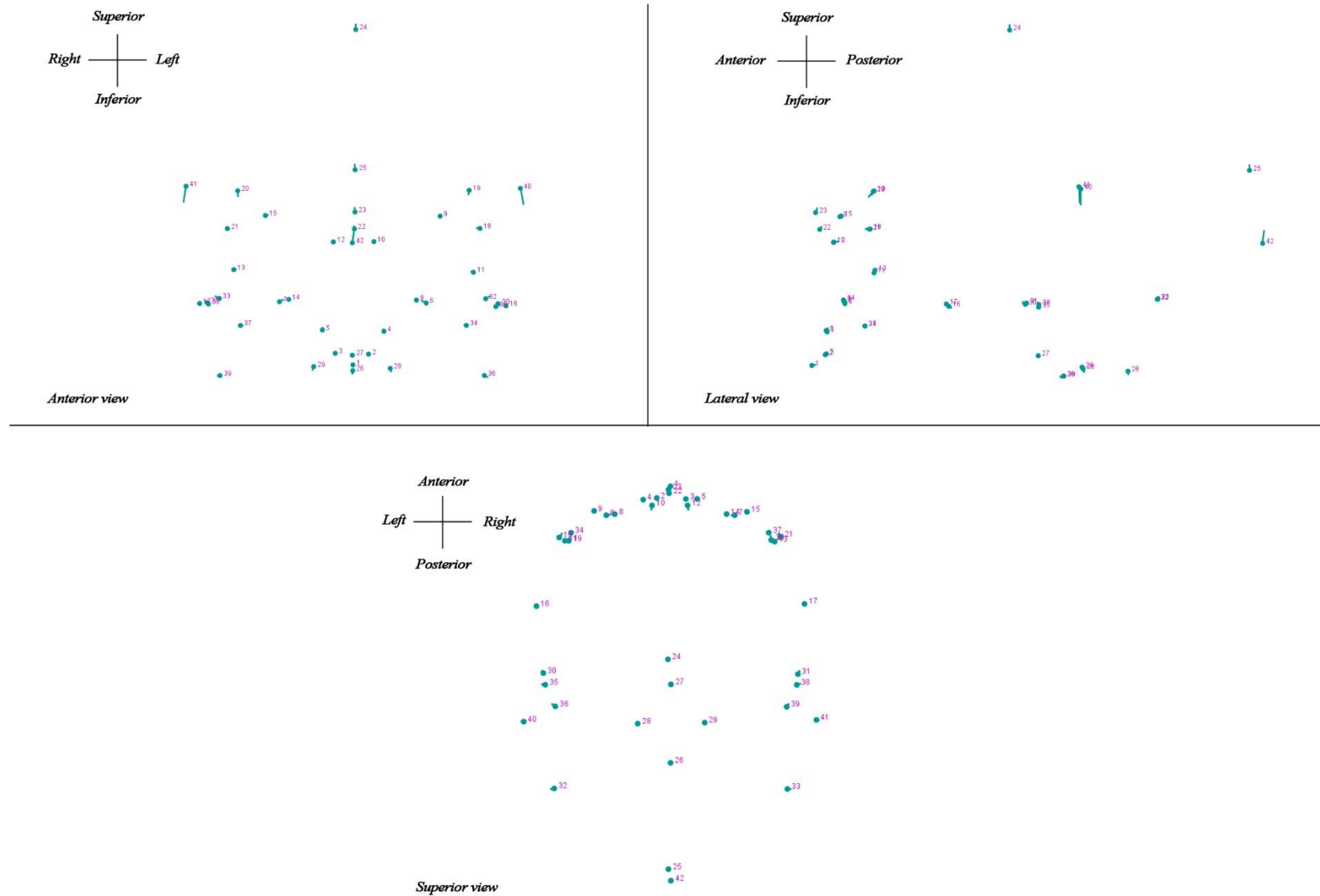


Figure A7.3. Lollipop graphs illustrating the shape differences between Indian and white South Africans in anterior (top left), lateral (top right), and superior (bottom) view. The dot indicates the Indian mean shape, while the line (lollipop stick) indicates the white mean shape.

Shape differences between black and white South Africans

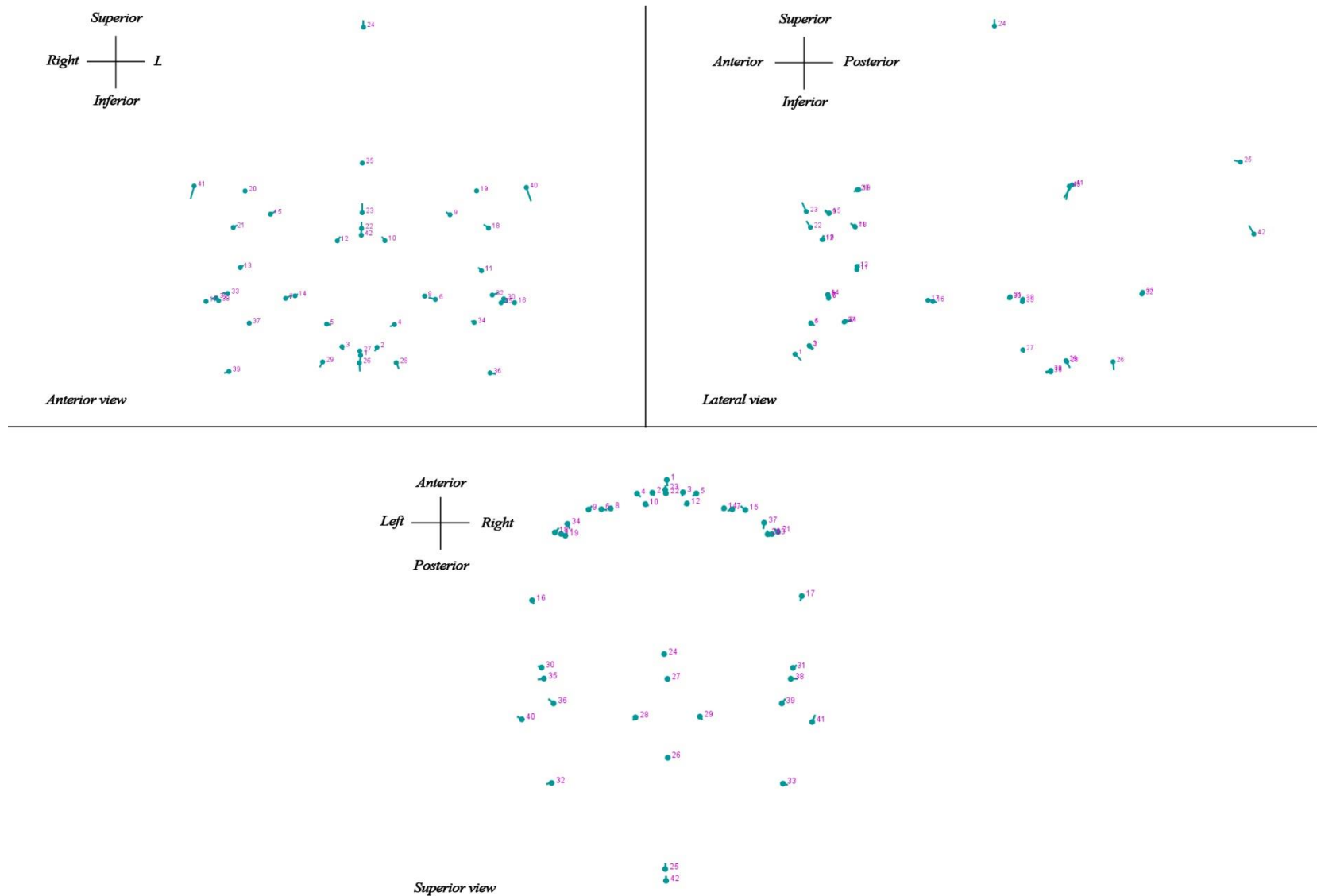


Figure A7.4. Lollipop graphs illustrating the shape differences between black and white South Africans in anterior (top left), lateral (top right), and superior (bottom) view. The dot indicates the black mean shape, while the line (lollipop stick) indicates the white mean shape.

Shape differences between coloured and Indian South Africans

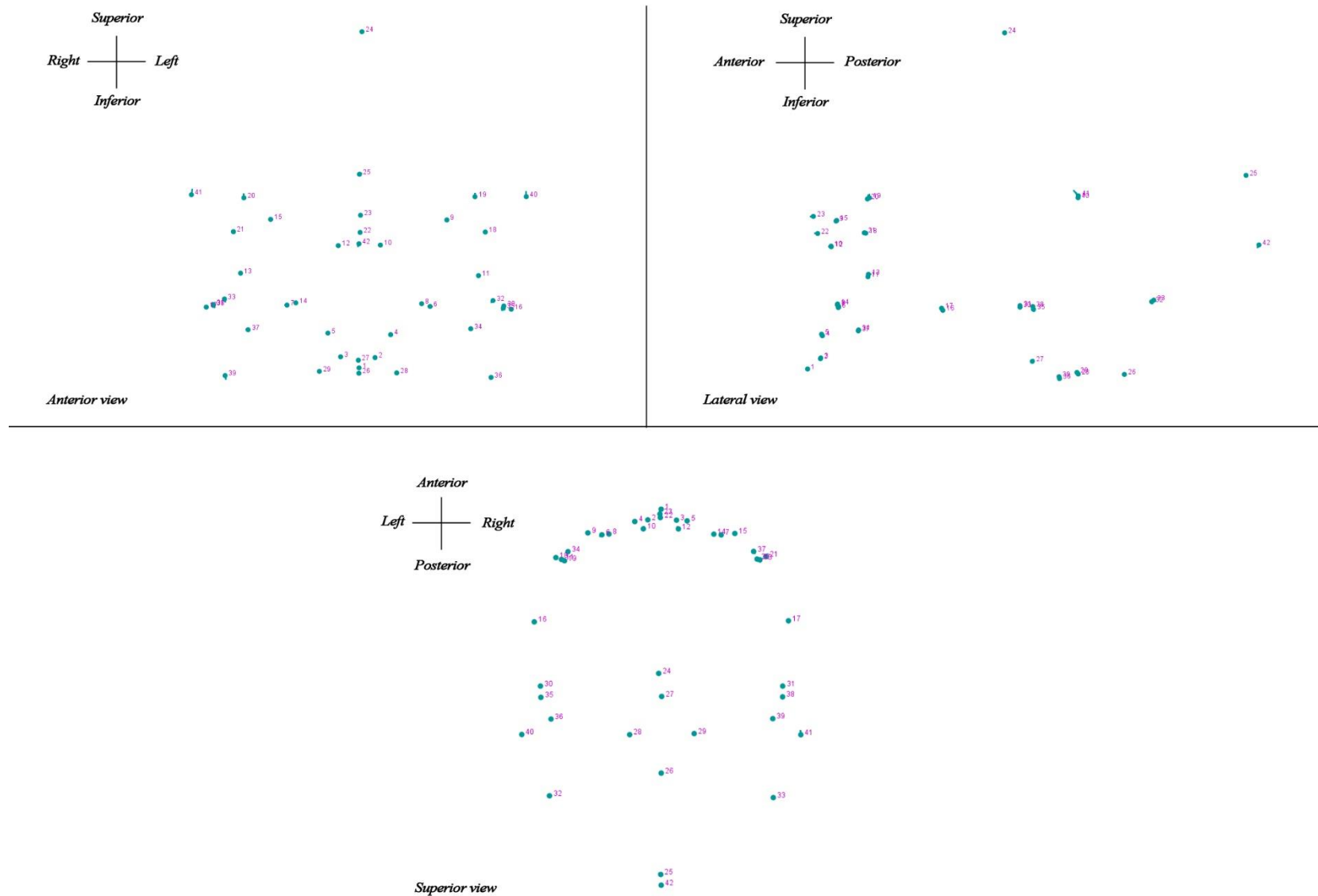


Figure A7.5. Lollipop graphs illustrating the shape differences between coloured and Indian South Africans in anterior (top left), lateral (top right), and superior (bottom) view. The dot indicates the coloured mean shape, while the line (lollipop stick) indicates the Indian mean shape.

Shape differences between coloured and white South Africans

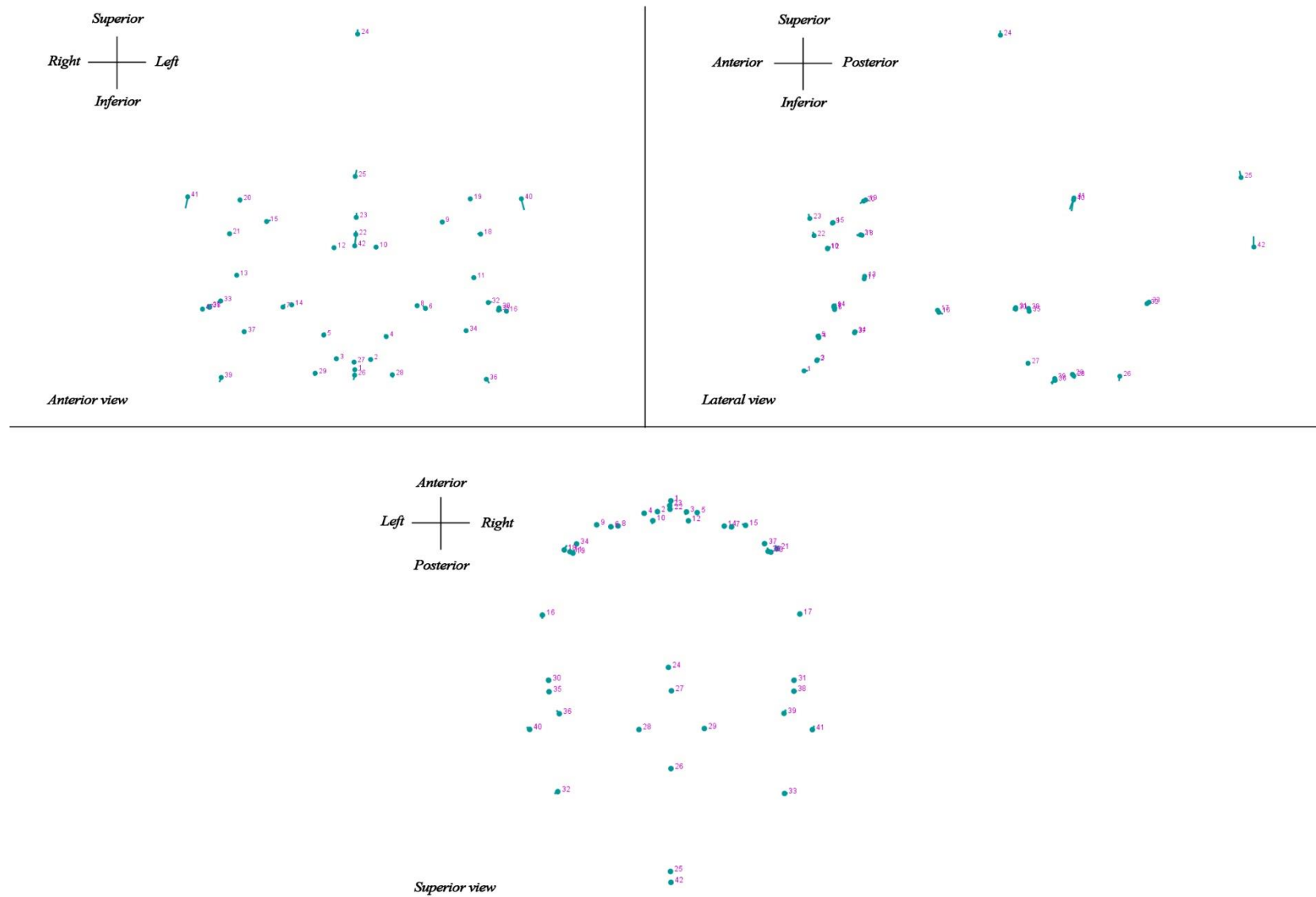


Figure A7.6. Lollipop graphs illustrating the shape differences between coloured and white South Africans in anterior (top left), lateral (top right), and superior (bottom) view. The dot indicates the coloured mean shape, while the line (lollipop stick) indicates the white mean shape.