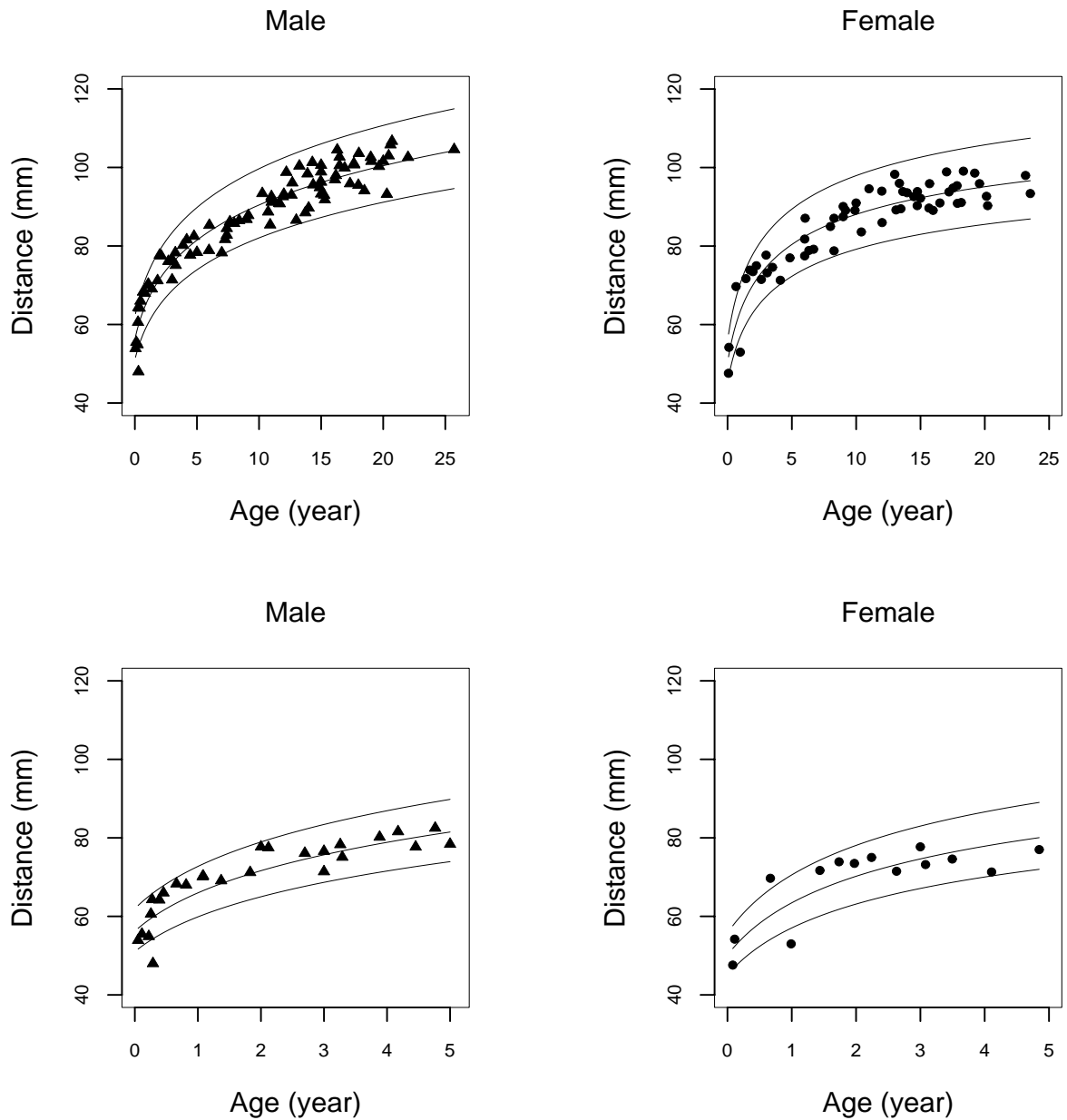


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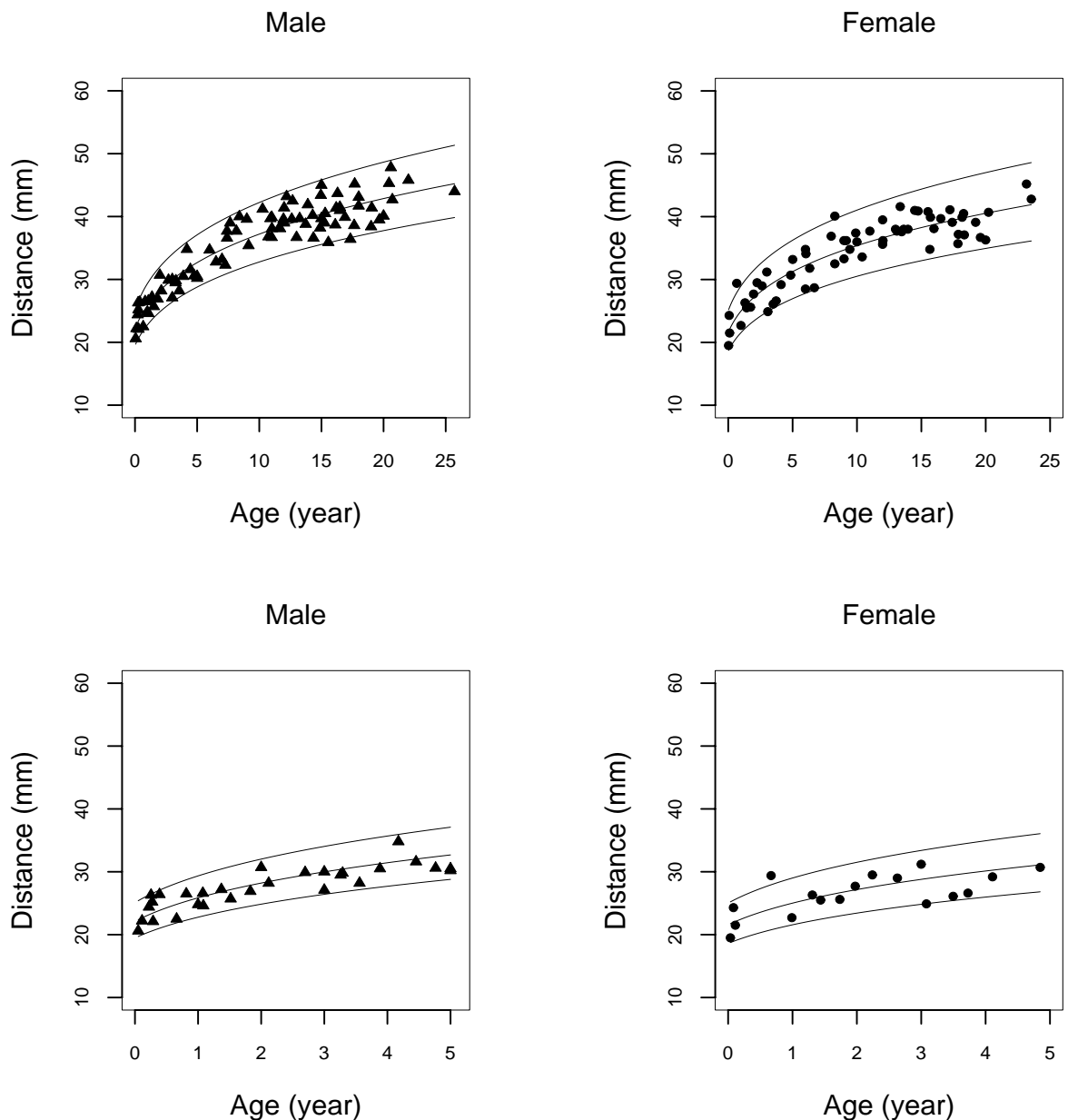
**Maximum maxillary width ( $zmi.l-zmi.r$ )**


**Figure 3.61** Graphs of maximum maxillary width ( $zmi.l-zmi.r$ ) versus age for males and females from birth to adulthood (above) and from birth to age five years (below).

**Table 3.61** Means (M), standard deviations (SD), minimum and maximum values (in mm) for maximum maxillary width ( $zmi.l-zmi.r$ ) at different age intervals.

Age group	Males					Females					Total				
	N	M	SD	Min	Max	N	M	SD	Min	Max	N	M	SD	Min	Max
0-1	10	60.4	6.92	48.0	68.3	4	56.1	9.49	47.6	69.7	14	59.2	7.61	47.6	69.7
1-3	9	73.3	3.55	69.1	77.7	6	73.9	2.30	71.5	77.7	15	73.6	3.03	69.1	77.7
3-5	7	79.1	2.52	75.1	82.5	4	74.0	2.40	71.3	77.0	11	77.3	3.48	71.3	82.5
5-10	11	84.1	3.22	78.3	87.8	13	84.8	4.88	77.5	91.0	24	84.5	4.13	77.5	91.0
10-12	10	91.1	2.44	85.4	93.4	3	90.7	6.18	83.6	94.6	13	91.0	3.30	83.6	94.6
12-14	8	93.9	5.24	86.6	100.4	7	92.4	4.30	86.0	98.3	15	93.2	4.73	86.0	100.4
14-16	10	96.2	3.21	91.8	101.3	7	92.0	2.44	89.1	95.9	17	94.5	3.56	89.1	101.3
16-18	10	99.6	2.94	95.5	104.5	6	94.1	3.01	90.9	98.9	16	97.5	3.95	90.9	104.5
18-25	12	101.6	4.15	93.2	106.7	8	94.9	3.48	90.3	99.1	20	98.9	5.09	90.3	106.7

**Posterior superior maxillary width (*ms.l-ms.r*)**

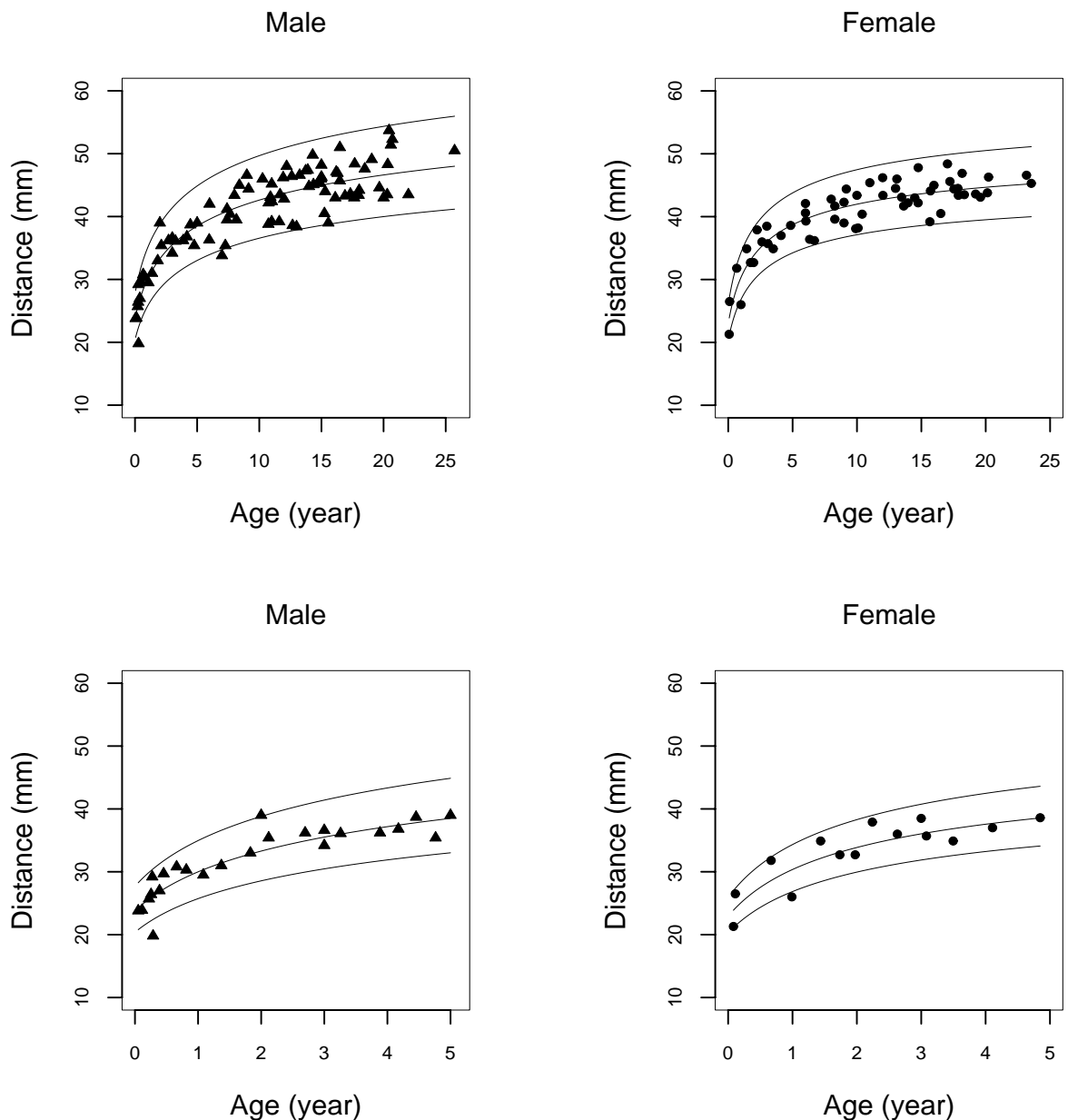


**Figure 3.62** Graphs of posterior superior maxillary width (*ms.l-ms.r*) versus age for males and females from birth to adulthood (above) and from birth to age five years (below).

**Table 3.62** Means (M), standard deviations (SD), minimum and maximum values (in mm) for posterior superior maxillary width (*ms.l-ms.r*) at different age intervals.

Age group	Males					Females					Total				
	N	M	SD	Min	Max	N	M	SD	Min	Max	N	M	SD	Min	Max
0-1	10	24.1	2.11	20.6	26.5	5	23.5	3.74	19.5	29.4	15	23.9	2.64	19.5	29.4
1-3	10	27.7	1.98	24.6	30.7	7	27.8	2.17	25.5	31.2	17	27.7	2.00	24.6	31.2
3-5	9	30.6	1.82	28.2	34.8	5	27.5	2.38	24.9	30.7	14	29.5	2.49	24.9	34.8
5-10	11	36.3	2.78	32.3	40.0	15	34.3	3.13	28.5	40.1	26	35.1	3.09	28.5	40.1
10-12	11	39.0	1.57	36.7	41.4	4	36.6	2.56	33.6	39.5	15	38.3	2.08	33.6	41.4
12-14	7	40.3	2.30	36.7	43.2	7	38.2	1.65	36.2	41.6	14	39.3	2.23	36.2	43.2
14-16	9	39.8	2.94	35.9	45.0	6	39.3	2.44	34.8	41.0	15	39.6	2.68	34.8	45.0
16-18	11	41.0	2.52	36.4	45.2	5	38.6	2.13	35.7	41.1	16	40.3	2.61	35.7	45.2
18-25	9	42.8	3.19	38.4	47.8	9	39.8	2.94	36.3	45.2	18	41.3	3.34	36.3	47.8

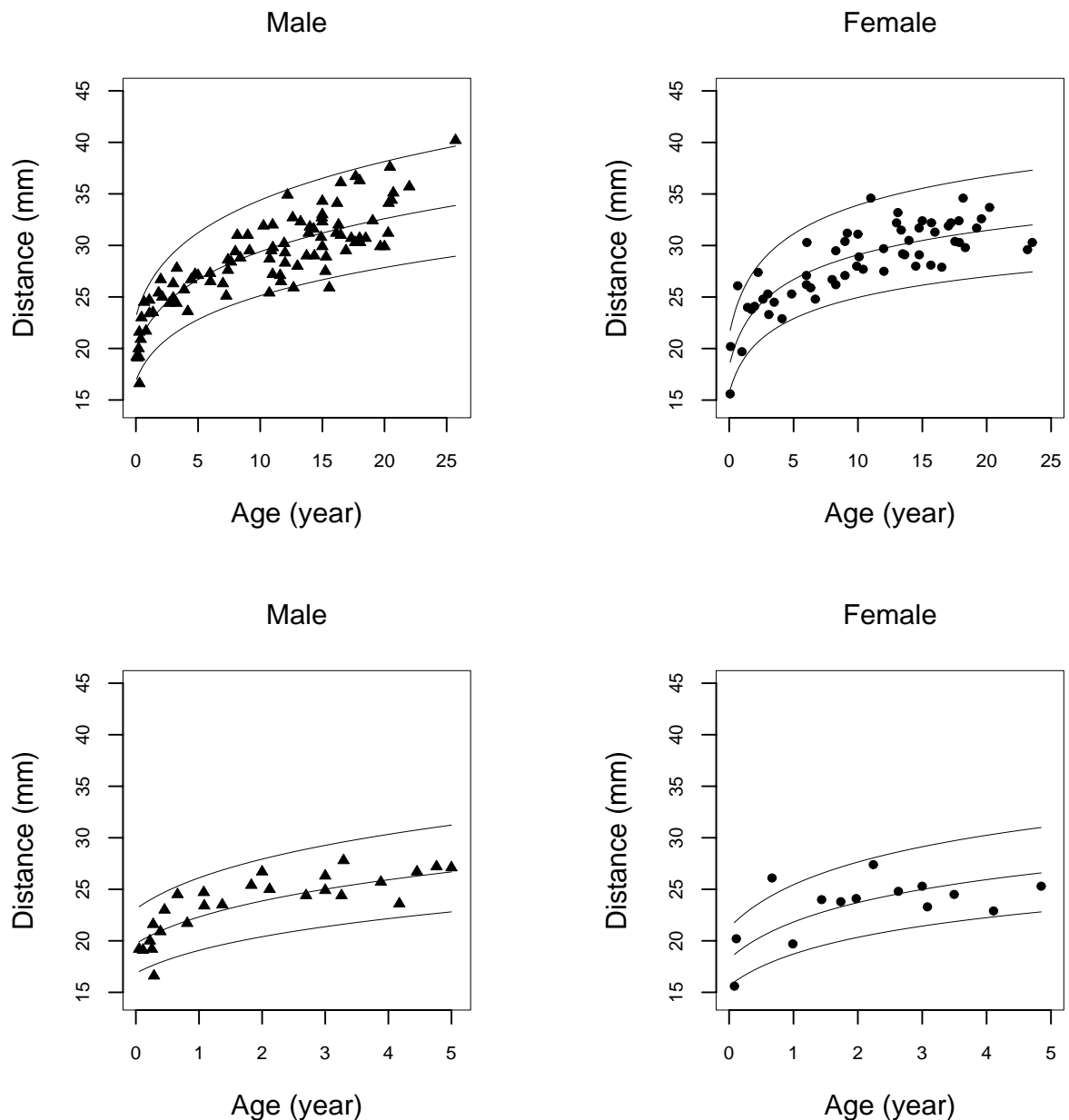
**Posterior inferior maxillary width (*mxt.l-mxt.r*)**



**Figure 3.63** Graphs of posterior inferior maxillary width (*mxt.l-mxt.r*) versus age for males and females from birth to adulthood (above) and from birth to age five years (below).

**Table 3.63** Means (M), standard deviations (SD), minimum and maximum values (in mm) for posterior inferior maxillary width (*mxt.l-mxt.r*) at different age intervals.

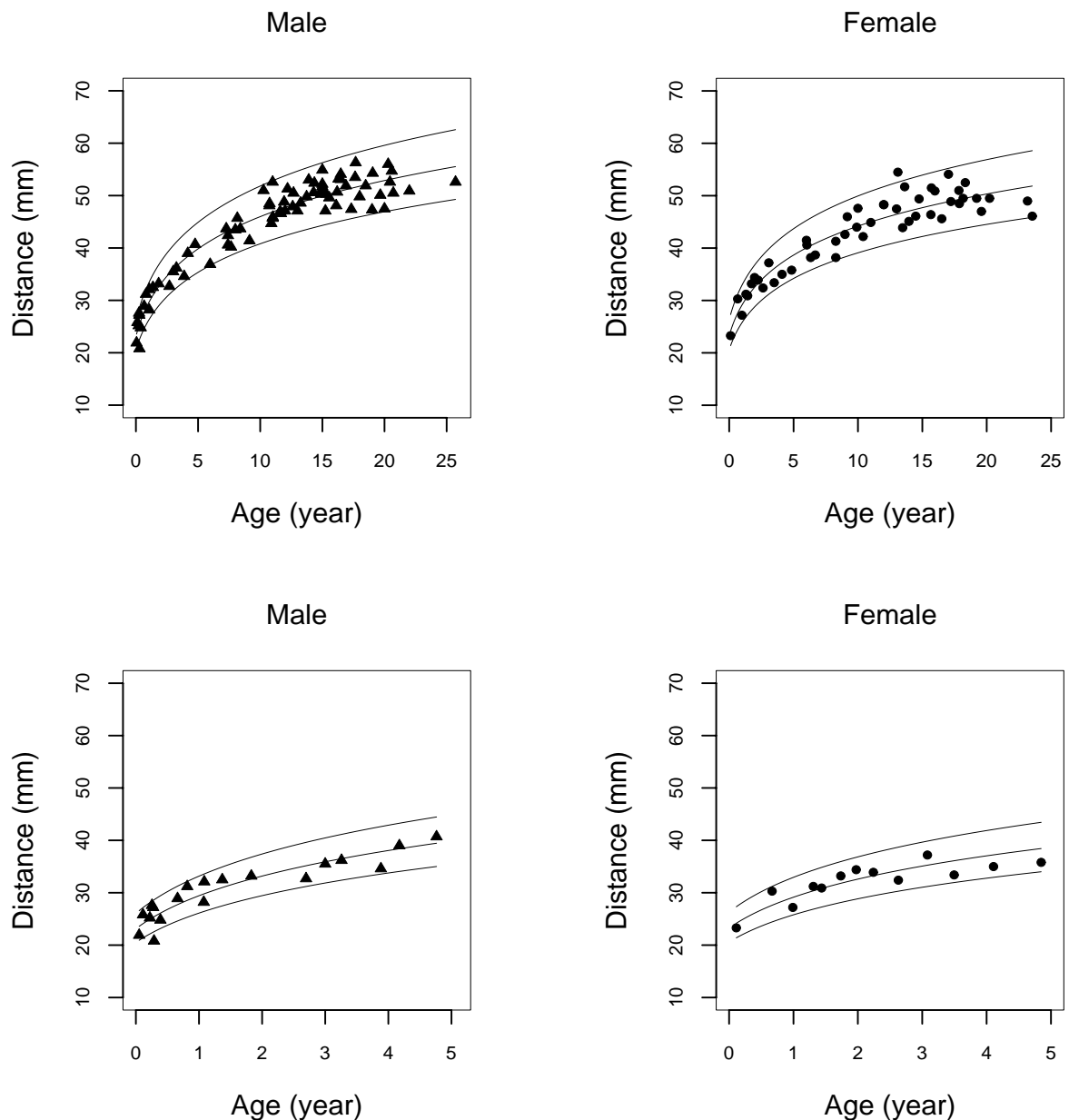
Age group	Males					Females					Total				
	N	M	SD	Min	Max	N	M	SD	Min	Max	N	M	SD	Min	Max
0-1	10	26.7	3.50	19.8	30.8	4	26.4	4.29	21.3	31.8	14	26.6	3.57	19.8	31.8
1-3	8	34.4	3.11	29.5	39.0	6	35.5	2.49	32.7	38.5	14	34.8	2.81	29.5	39.0
3-5	6	37.0	1.48	35.4	39.0	4	36.6	1.62	34.9	38.6	10	36.8	1.47	34.9	39.0
5-10	12	40.6	3.98	33.8	46.6	13	40.5	2.61	36.2	44.4	25	40.5	3.27	33.8	46.6
10-12	11	42.6	2.65	38.8	46.2	4	42.6	3.87	38.2	46.2	15	42.6	2.87	38.2	46.2
12-14	8	44.7	3.93	38.4	48.0	6	43.5	1.57	41.7	46.0	14	44.2	3.11	38.4	48.0
14-16	10	45.0	3.24	39.0	49.8	6	43.6	2.88	39.2	47.8	16	44.5	3.10	39.0	49.8
16-18	10	45.5	2.76	43.0	51.0	6	44.5	2.59	40.5	48.4	16	45.1	2.66	40.5	51.0
18-25	12	47.6	3.82	43.0	53.7	8	44.9	1.56	43.1	46.9	20	46.5	3.35	43.0	53.7

Posterior palatal width (*gpf.l-gpf.r*)

**Figure 3.64** Graphs of posterior palatal width (*gpf.l-gpf.r*) versus age for males and females from birth to adulthood (above) and from birth to age five years (below).

**Table 3.64** Means (M), standard deviations (SD), minimum and maximum values (in mm) for posterior palatal width (*gpf.l-gpf.r*) at different age intervals.

Age group	Males					Females					Total				
	N	M	SD	Min	Max	N	M	SD	Min	Max	N	M	SD	Min	Max
0-1	10	20.6	2.26	16.6	24.5	4	20.4	4.32	15.6	26.1	14	20.5	2.80	15.6	26.1
1-3	9	24.9	1.12	23.4	26.7	6	24.9	1.35	23.8	27.4	15	24.9	1.17	23.4	27.4
3-5	7	26.1	1.57	23.6	27.8	4	24.0	1.10	22.9	25.3	11	25.3	1.71	22.9	27.8
5-10	12	28.3	1.82	25.1	31.0	13	28.0	2.19	24.8	31.2	25	28.2	1.98	24.8	31.2
10-12	12	28.8	2.05	25.4	32.0	4	30.2	3.03	27.7	34.6	16	29.2	2.30	25.4	34.6
12-14	8	30.7	2.90	25.9	34.9	7	30.5	1.99	27.5	33.2	15	30.6	2.43	25.9	34.9
14-16	11	30.5	2.56	25.9	34.3	7	30.4	1.94	28.0	32.4	18	30.5	2.27	25.9	34.3
16-18	11	32.6	2.68	29.5	36.7	6	30.9	1.70	27.9	32.4	17	32.0	2.48	27.9	36.7
18-25	12	33.5	3.31	29.9	40.2	7	31.8	1.97	29.6	34.6	19	32.8	2.95	29.6	40.2

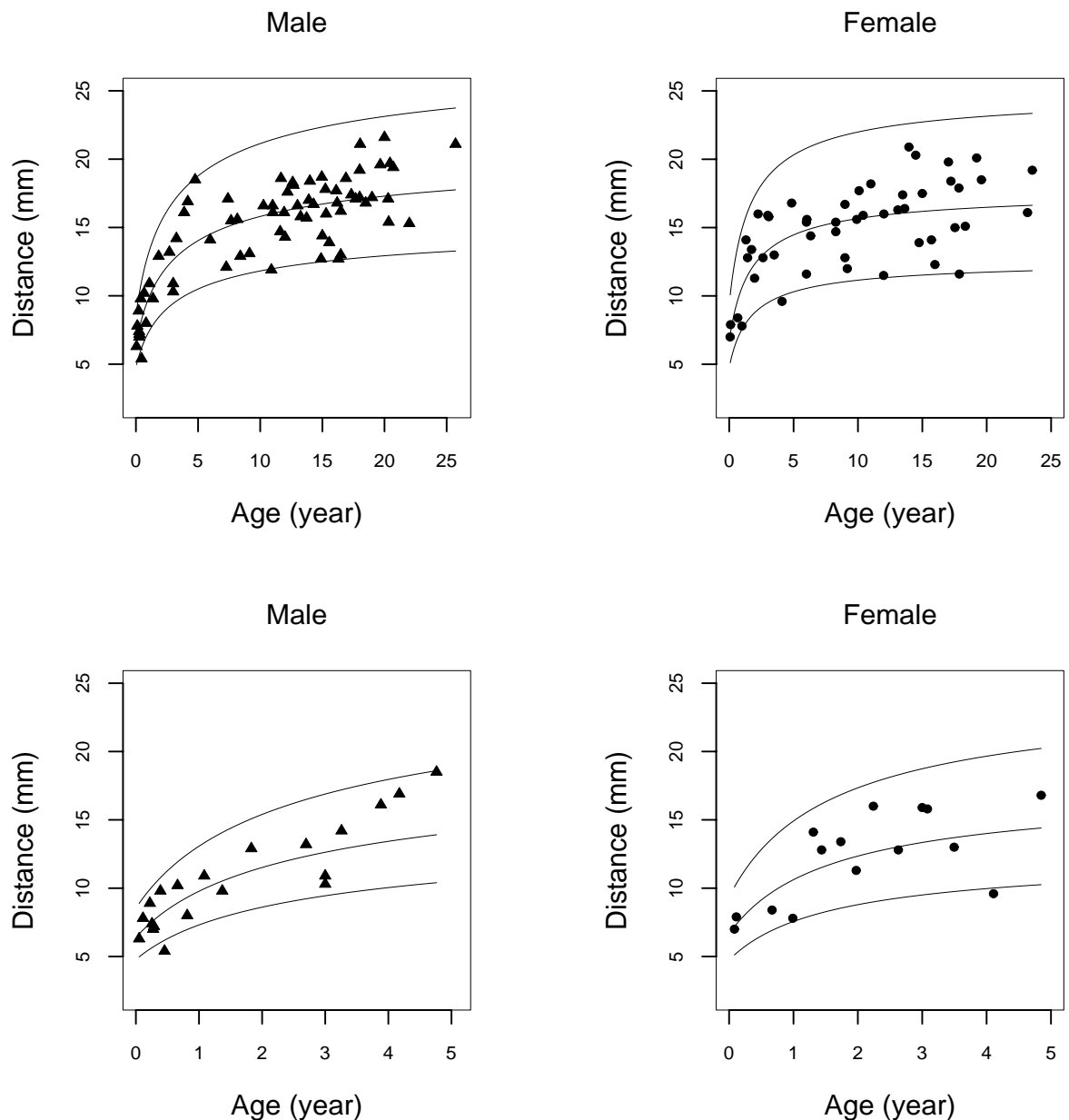
Anterior upper face height (*n-ans*)

**Figure 3.65** Graphs of anterior upper face height (*n-ans*) versus age for males and females from birth to adulthood (above) and from birth to age five years (below).

**Table 3.65** Means (M), standard deviations (SD), minimum and maximum values (in mm) for anterior upper face height (*n-ans*) at different age intervals.

Age group	Males					Females					Total				
	N	M	SD	Min	Max	N	M	SD	Min	Max	N	M	SD	Min	Max
0-1	9	25.9	3.27	20.8	31.2	3	26.9	3.51	23.3	30.3	12	26.2	3.19	20.8	31.2
1-3	6	32.4	2.37	28.2	35.5	6	32.7	1.43	30.9	34.4	12	32.5	1.87	28.2	35.5
3-5	4	37.6	2.74	34.6	40.7	4	35.4	1.59	33.4	37.2	8	36.5	2.40	33.4	40.7
5-10	9	42.0	2.58	36.9	45.7	10	41.9	3.23	38.2	47.6	19	41.9	2.86	36.9	47.6
10-12	11	47.8	2.35	44.7	52.6	3	45.1	3.06	42.2	48.3	14	47.2	2.64	42.2	52.6
12-14	7	49.7	2.05	47.1	53.0	6	48.5	4.00	43.9	54.5	13	49.2	3.03	43.9	54.5
14-16	10	51.0	2.04	47.1	54.9	5	48.9	2.50	46.1	51.5	15	50.3	2.36	46.1	54.9
16-18	10	51.8	2.80	47.4	56.3	5	49.6	3.16	45.6	54.1	15	51.1	3.00	45.6	56.3
18-25	11	51.7	2.78	47.3	56.0	7	49.0	2.06	46.1	52.5	18	50.6	2.80	46.1	56.0

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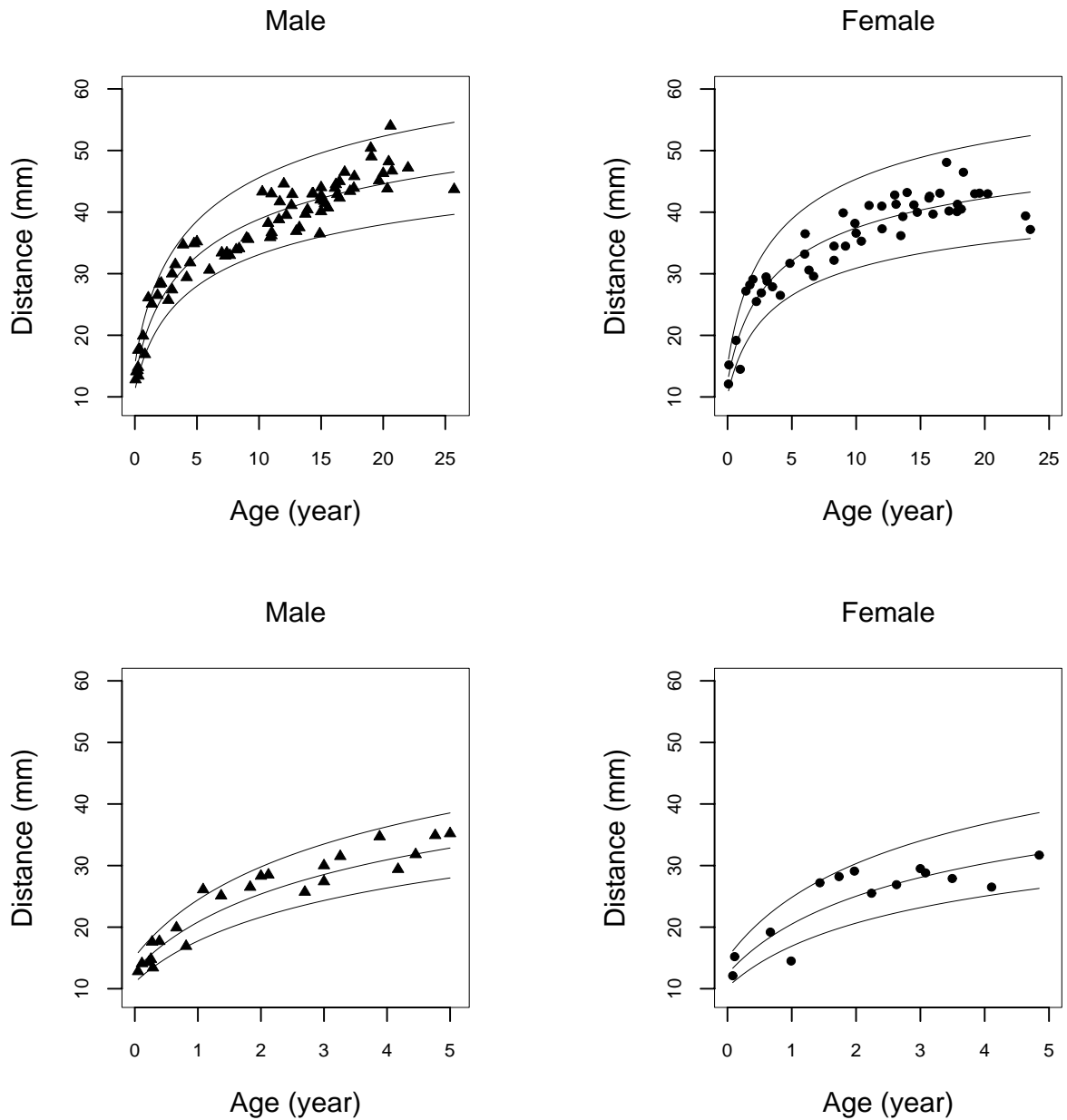
**Anterior maxillary alveolar height (*ans-pr*)**


**Figure 3.66** Graphs of anterior maxillary alveolar height (*ans-pr*) versus age for males and females from birth to adulthood (above) and from birth to age five years (below).

**Table 3.66** Means (M), standard deviations (SD), minimum and maximum values (in mm) for anterior maxillary alveolar height (*ans-pr*) at different age intervals.

Age group	Males					Females					Total				
	N	M	SD	Min	Max	N	M	SD	Min	Max	N	M	SD	Min	Max
0-1	10	7.8	1.50	5.4	10.2	4	7.8	0.58	7.0	8.4	14	7.8	1.28	5.4	10.2
1-3	6	11.3	1.40	9.8	13.2	7	13.8	1.72	11.3	16.0	13	12.6	1.97	9.8	16.0
3-5	4	16.4	1.79	14.2	18.5	4	13.8	3.23	9.6	16.8	8	15.1	2.79	9.6	18.5
5-10	7	14.3	1.79	12.1	17.1	10	14.4	1.71	11.6	16.7	17	14.4	1.69	11.6	17.1
10-12	8	15.6	1.99	11.9	18.6	4	15.8	3.05	11.5	18.2	12	15.7	2.25	11.5	18.6
12-14	8	17.2	1.08	15.7	18.4	5	17.4	2.03	16.0	20.9	13	17.3	1.44	15.7	20.9
14-16	7	15.7	2.18	12.7	18.7	5	15.6	3.23	12.3	20.3	12	15.7	2.53	12.3	20.3
16-18	10	16.6	2.15	12.7	19.2	5	16.5	3.27	11.6	19.8	15	16.6	2.45	11.6	19.8
18-25	11	18.6	2.30	15.3	21.6	5	17.8	2.12	15.1	20.1	16	18.3	2.20	15.1	21.6

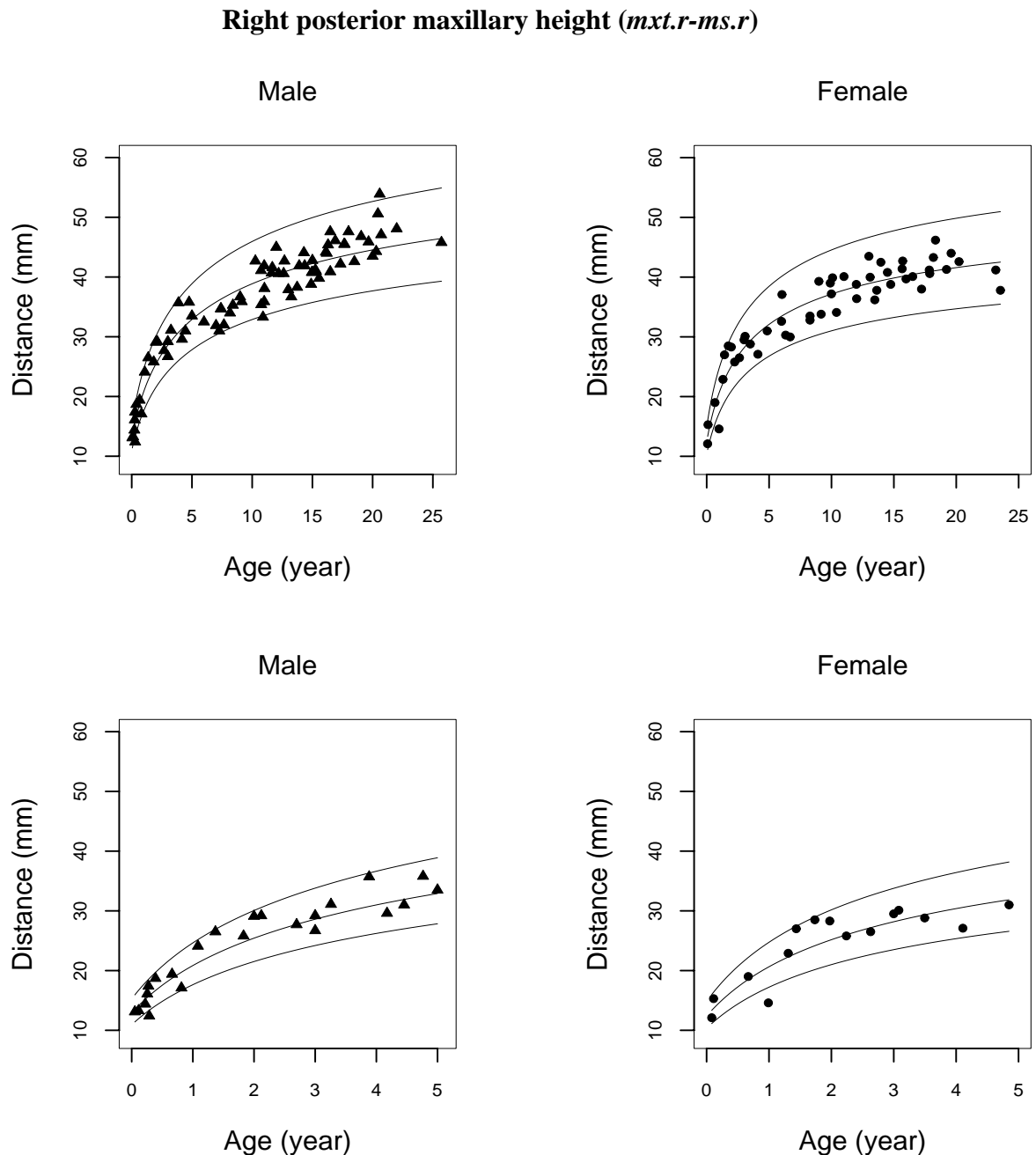
**Left posterior maxillary height (*mxt.l-ms.l*)**



**Figure 3.67** Graphs of left posterior maxillary height (*mxt.l-ms.l*) versus age for males and females from birth to adulthood (above) and from birth to age five years (below).

**Table 3.67** Means (M), standard deviations (SD), minimum and maximum values (in mm) for left posterior maxillary height (*mxt.l-ms.l*) at different age intervals.

Age group	Males					Females					Total				
	N	M	SD	Min	Max	N	M	SD	Min	Max	N	M	SD	Min	Max
0-1	9	15.7	2.39	12.8	19.9	4	15.3	2.95	12.1	19.2	13	15.6	2.46	12.1	19.9
1-3	8	27.2	1.65	25.1	30.0	6	27.7	1.49	25.5	29.5	14	27.4	1.55	25.1	30.0
3-5	6	32.9	2.36	29.4	35.2	4	28.7	2.20	26.5	31.7	10	31.2	3.07	26.5	35.2
5-10	10	33.6	1.47	30.6	35.8	10	34.6	3.29	29.6	39.9	20	34.1	2.53	29.6	39.9
10-12	9	39.8	3.36	35.9	44.6	3	39.1	3.32	35.3	41.1	12	39.7	3.21	35.3	44.6
12-14	7	39.7	2.06	36.9	42.9	6	40.0	2.90	36.2	43.2	13	39.9	2.38	36.2	43.2
14-16	10	41.5	2.11	36.5	44.0	5	41.2	1.31	39.7	42.6	15	41.4	1.84	36.5	44.0
16-18	9	44.2	1.35	42.3	46.5	5	42.6	3.32	40.1	48.1	14	43.6	2.29	40.1	48.1
18-25	10	47.4	3.15	43.7	54.0	7	41.8	3.04	37.2	46.5	17	45.1	4.15	37.2	54.0



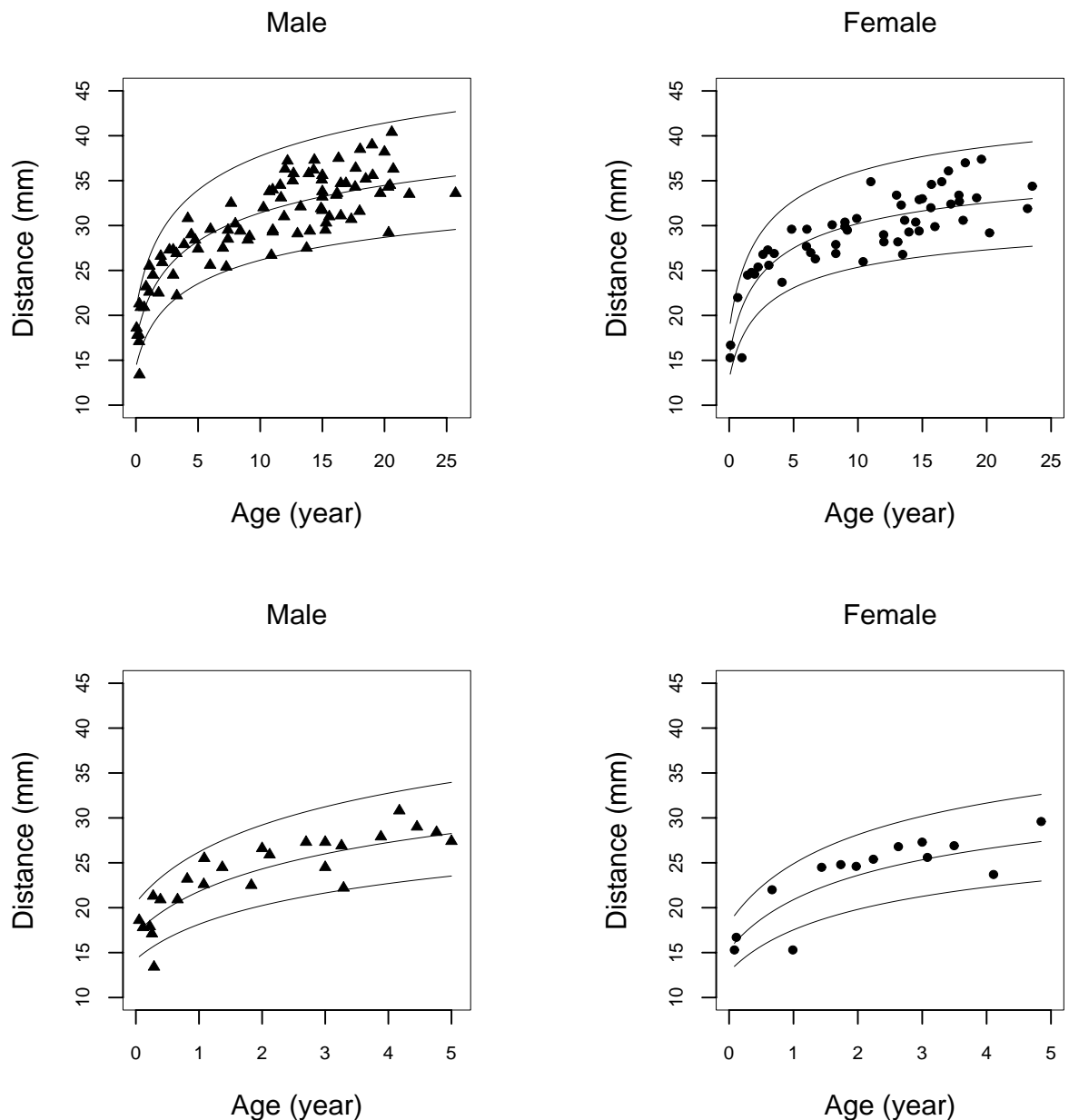
**Figure 3.68** Graphs of right posterior maxillary height (*mxt.r-ms.r*) versus age for males and females from birth to adulthood (above) and from birth to age five years (below).

**Table 3.68** Means (M), standard deviations (SD), minimum and maximum values (in mm) for right posterior maxillary height (*mxt.r-ms.r*) at different age intervals.

Age group	Males					Females					Total				
	N	M	SD	Min	Max	N	M	SD	Min	Max	N	M	SD	Min	Max
0-1	9	15.8	2.57	12.4	19.4	4	15.3	2.85	12.1	19.0	13	15.6	2.55	12.1	19.4
1-3	8	27.3	1.86	24.1	29.2	7	26.9	2.19	22.9	29.5	15	27.1	1.95	22.9	29.5
3-5	6	32.8	2.62	29.6	35.8	4	29.3	1.69	27.1	31.0	10	31.4	2.84	27.1	35.8
5-10	10	33.9	1.92	31.0	36.7	10	34.6	3.39	30.0	39.3	20	34.2	2.70	30.0	39.3
10-12	10	39.6	3.72	33.3	45.0	4	38.2	2.81	34.1	40.1	14	39.2	3.44	33.3	45.0
12-14	7	39.8	2.22	36.7	42.7	6	39.4	3.12	36.2	43.5	13	39.6	2.56	36.2	43.5
14-16	9	41.2	1.56	38.8	44.1	5	40.7	1.51	38.8	42.7	14	41.0	1.51	38.8	44.1
16-18	10	44.9	2.15	40.9	47.6	4	40.0	1.39	38.0	41.2	14	43.5	3.00	38.0	47.6
18-25	10	46.9	3.39	42.6	53.9	7	42.3	2.63	37.8	46.2	17	45.0	3.78	37.8	53.9



**Left anterior zygo-maxillary suture length (*or.l-zmi.l*)**

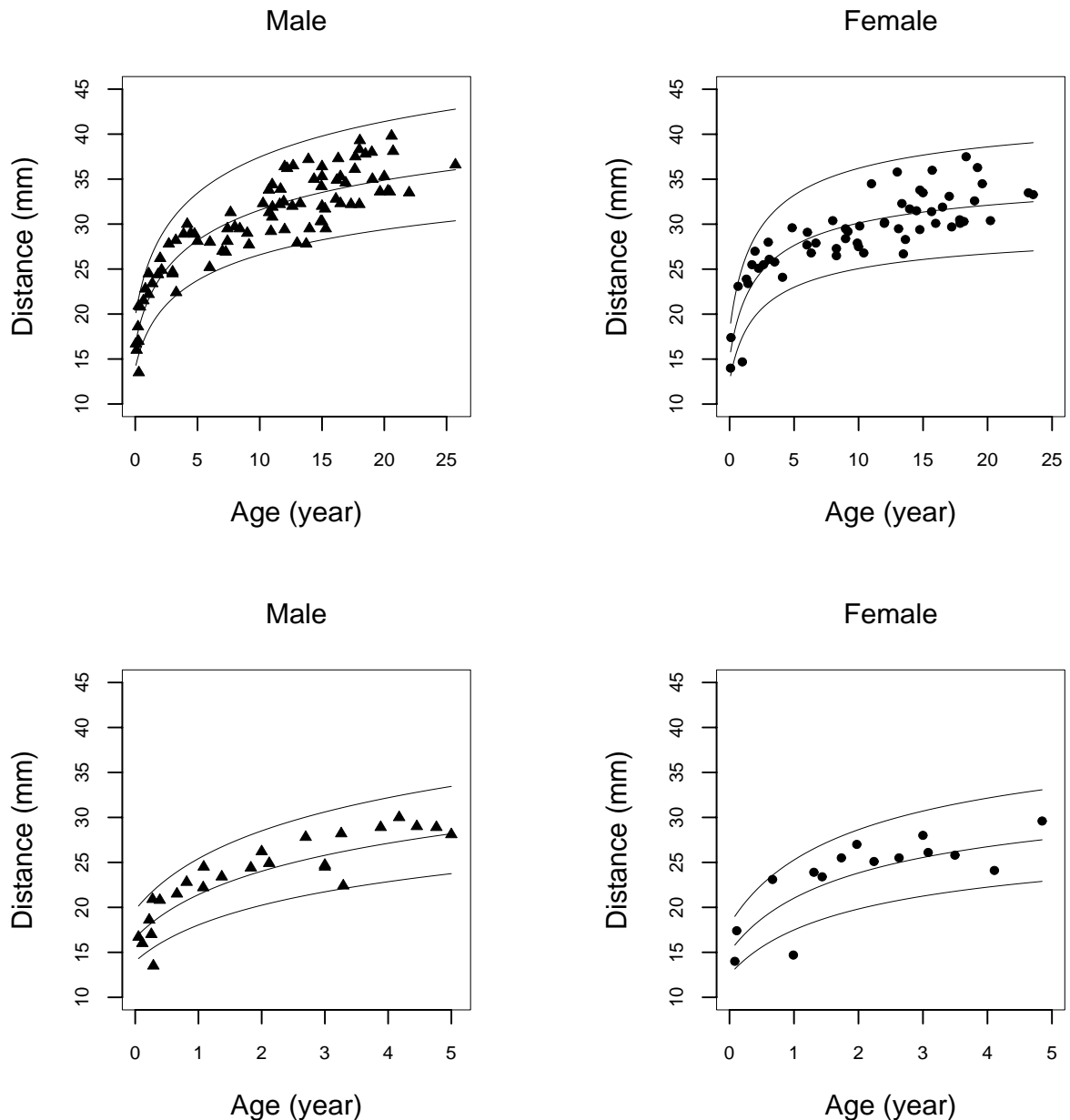


**Figure 3.69** Graphs of left anterior zygo-maxillary suture length (*or.l-zmi.l*) versus age for males and females from birth to adulthood (above) and from birth to age five years (below).

**Table 3.69** Means (M), standard deviations (SD), minimum and maximum values (in mm) for left anterior zygo-maxillary suture length (*or.l-zmi.l*) at different age intervals.

Age group	Males					Females					Total				
	N	M	SD	Min	Max	N	M	SD	Min	Max	N	M	SD	Min	Max
0-1	9	19.0	2.91	13.4	23.2	4	17.3	3.19	15.3	22.0	13	18.5	2.98	13.4	23.2
1-3	9	25.2	1.82	22.5	27.3	6	25.6	1.20	24.5	27.3	15	25.3	1.56	22.5	27.3
3-5	7	27.5	2.66	22.2	30.8	4	26.5	2.48	23.7	29.6	11	27.1	2.53	22.2	30.8
5-10	11	28.7	2.02	25.4	32.5	11	28.7	1.60	26.3	30.8	22	28.7	1.78	25.4	32.5
10-12	10	32.0	2.90	26.7	36.3	3	30.0	4.53	26.0	34.9	13	31.5	3.25	26.0	36.3
12-14	8	32.7	3.70	27.5	37.2	7	29.8	2.39	26.8	33.4	15	31.4	3.40	26.8	37.2
14-16	11	33.2	2.58	29.5	37.3	7	31.7	1.91	29.4	34.6	18	32.7	2.40	29.4	37.3
16-18	10	33.8	2.22	30.7	37.5	5	33.9	1.56	32.4	36.1	15	33.8	1.97	30.7	37.5
18-25	13	35.5	2.98	29.2	40.4	7	33.4	3.10	29.2	37.4	20	34.8	3.13	29.2	40.4

**Right anterior zygo-maxillary suture length (*or.r-zmi.r*)**

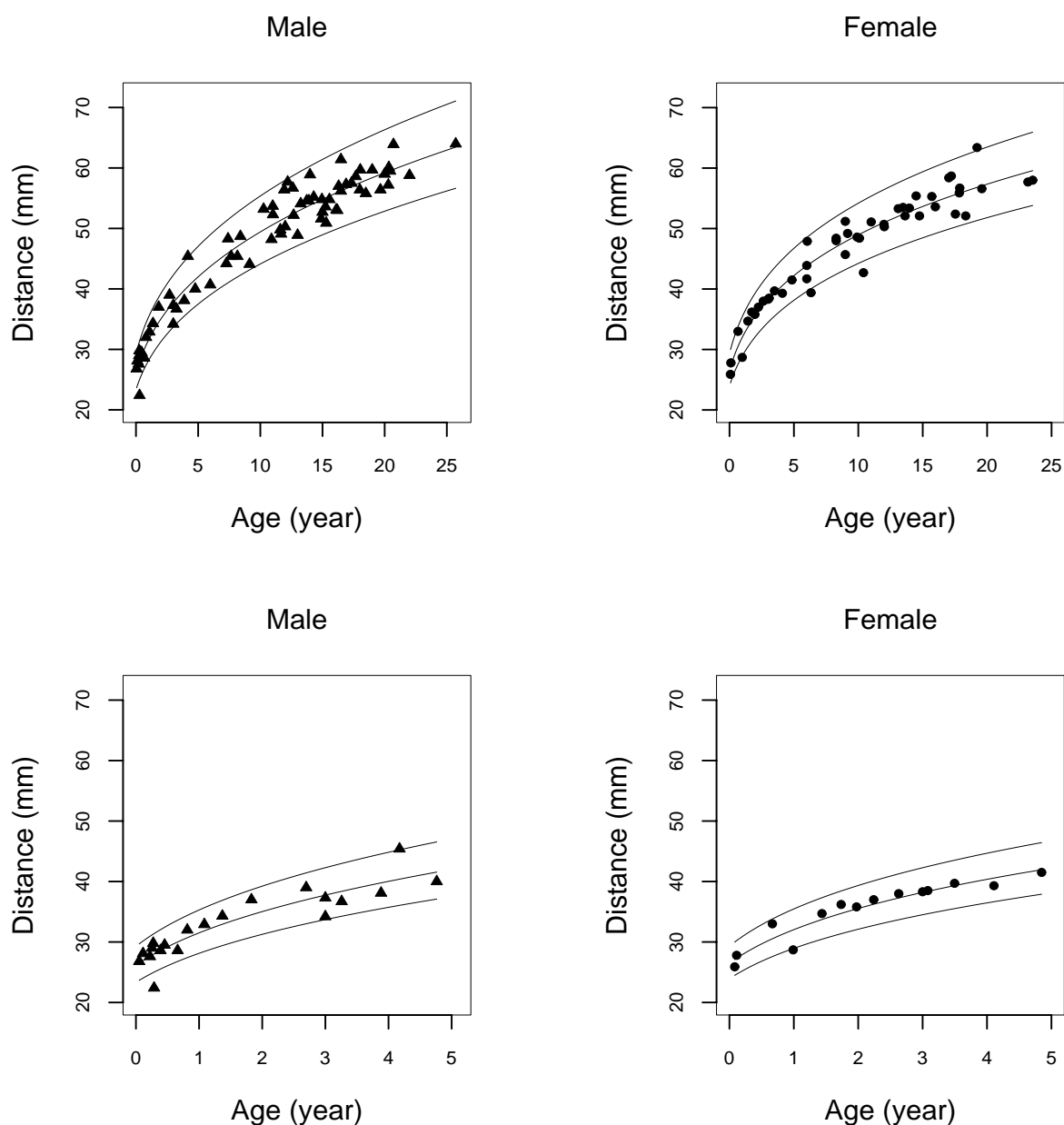


**Figure 3.70** Graphs of right anterior zygo-maxillary suture length (*or.r-zmi.r*) versus age for males and females from birth to adulthood (above) and from birth to age five years (below).

**Table 3.70** Means (M), standard deviations (SD), minimum and maximum values (in mm) for right anterior zygo-maxillary suture length (*or.r-zmi.r*) at different age intervals.

Age group	Males					Females					Total				
	N	M	SD	Min	Max	N	M	SD	Min	Max	N	M	SD	Min	Max
0-1	9	18.6	3.06	13.5	22.8	4	17.3	4.14	14.0	23.1	13	18.2	3.31	13.5	23.1
1-3	9	24.7	1.58	22.2	27.8	7	25.5	1.61	23.4	28.0	16	25.1	1.59	22.2	28.0
3-5	7	27.9	2.52	22.4	30.0	4	26.4	2.31	24.1	29.6	11	27.4	2.45	22.4	30.0
5-10	11	28.4	1.67	25.2	31.3	12	28.2	1.17	26.5	30.4	23	28.3	1.40	25.2	31.3
10-12	12	32.3	2.08	29.2	36.4	4	30.3	3.17	26.8	34.5	16	31.8	2.45	26.8	36.4
12-14	8	32.4	3.86	27.8	37.2	7	30.6	2.97	26.7	35.8	15	31.6	3.48	26.7	37.2
14-16	9	32.7	2.53	29.5	36.4	7	32.2	2.31	29.4	36.0	16	32.5	2.37	29.4	36.4
16-18	11	34.9	2.27	32.2	38.3	5	31.1	1.41	29.7	33.1	16	33.7	2.70	29.7	38.3
18-25	12	36.2	2.36	33.5	39.8	8	33.6	2.55	30.3	37.5	20	35.1	2.72	30.3	39.8

**Left inferior maxillary length (*mxt.l-pr*)**

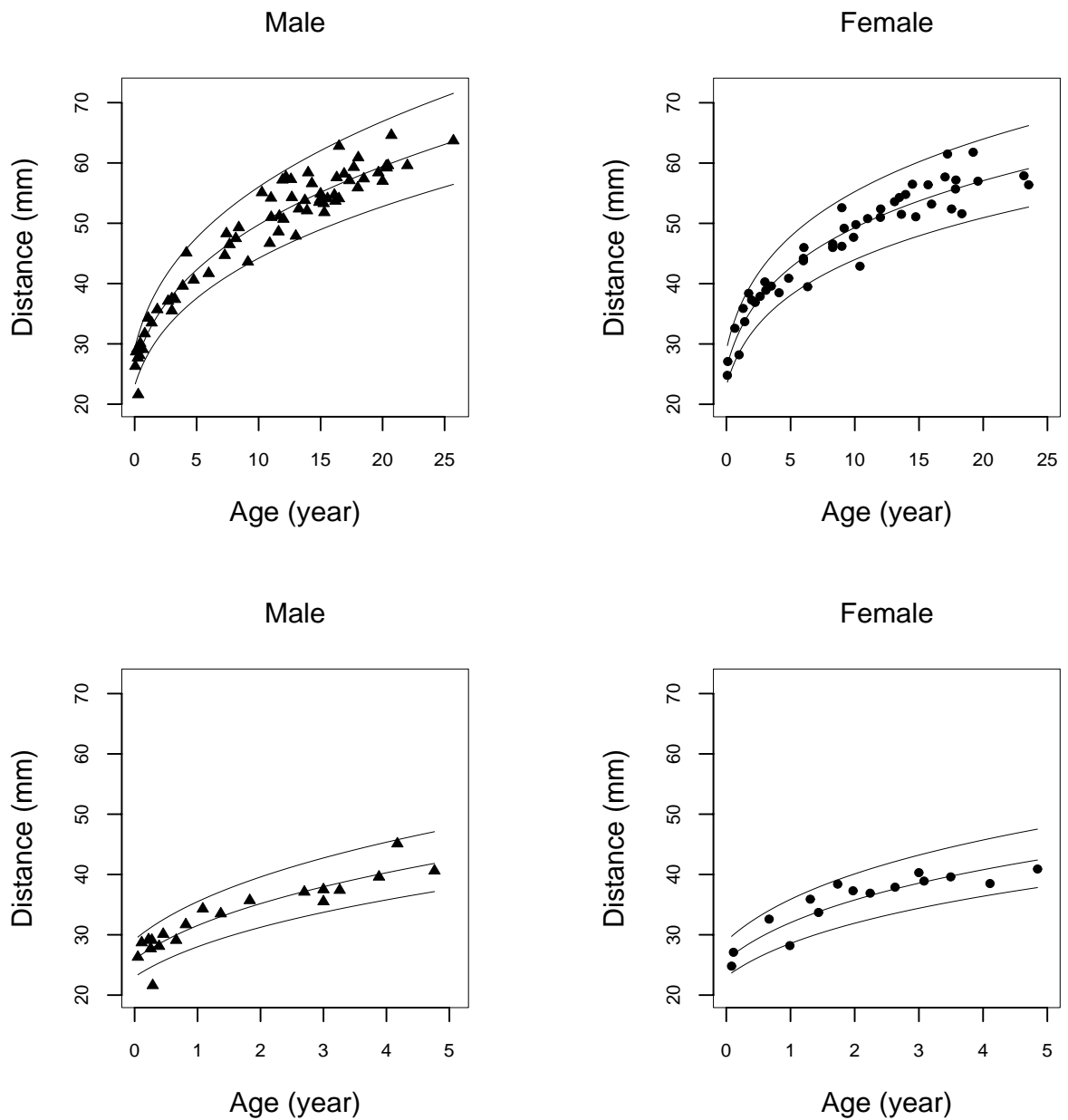


**Figure 3.71** Graphs of left inferior maxillary length (*mxt.l-pr*) versus age for males and females from birth to adulthood (above) and from birth to age five years (below).

**Table 3.71** Means (M), standard deviations (SD), minimum and maximum values (in mm) for left inferior maxillary length (*mxt.l-pr*) at different age intervals.

Age group	Males					Females					Total				
	N	M	SD	Min	Max	N	M	SD	Min	Max	N	M	SD	Min	Max
0-1	10	28.2	2.49	22.4	32.0	4	28.9	3.00	25.9	33.0	14	28.4	2.54	22.4	33.0
1-3	6	35.8	2.33	32.9	39.0	6	36.7	1.37	34.7	38.3	12	36.2	1.88	32.9	39.0
3-5	4	40.1	3.81	36.7	45.4	4	39.8	1.27	38.5	41.5	8	39.9	2.64	36.7	45.4
5-10	7	45.3	2.72	40.7	48.7	10	46.4	3.69	39.4	51.2	17	45.9	3.28	39.4	51.2
10-12	8	51.6	2.76	48.2	56.4	4	48.2	3.87	42.7	51.1	12	50.5	3.42	42.7	56.4
12-14	8	54.7	3.18	48.9	58.9	5	52.5	1.36	50.3	53.5	13	53.9	2.79	48.9	58.9
14-16	7	53.4	1.69	50.9	55.2	4	54.1	1.57	52.1	55.4	11	53.6	1.61	50.9	55.4
16-18	9	56.7	2.59	53.0	61.4	5	56.4	2.53	52.4	58.7	14	56.6	2.48	52.4	61.4
18-25	11	59.5	2.63	55.8	64.0	5	57.6	4.03	52.1	63.4	16	58.9	3.13	52.1	64.0

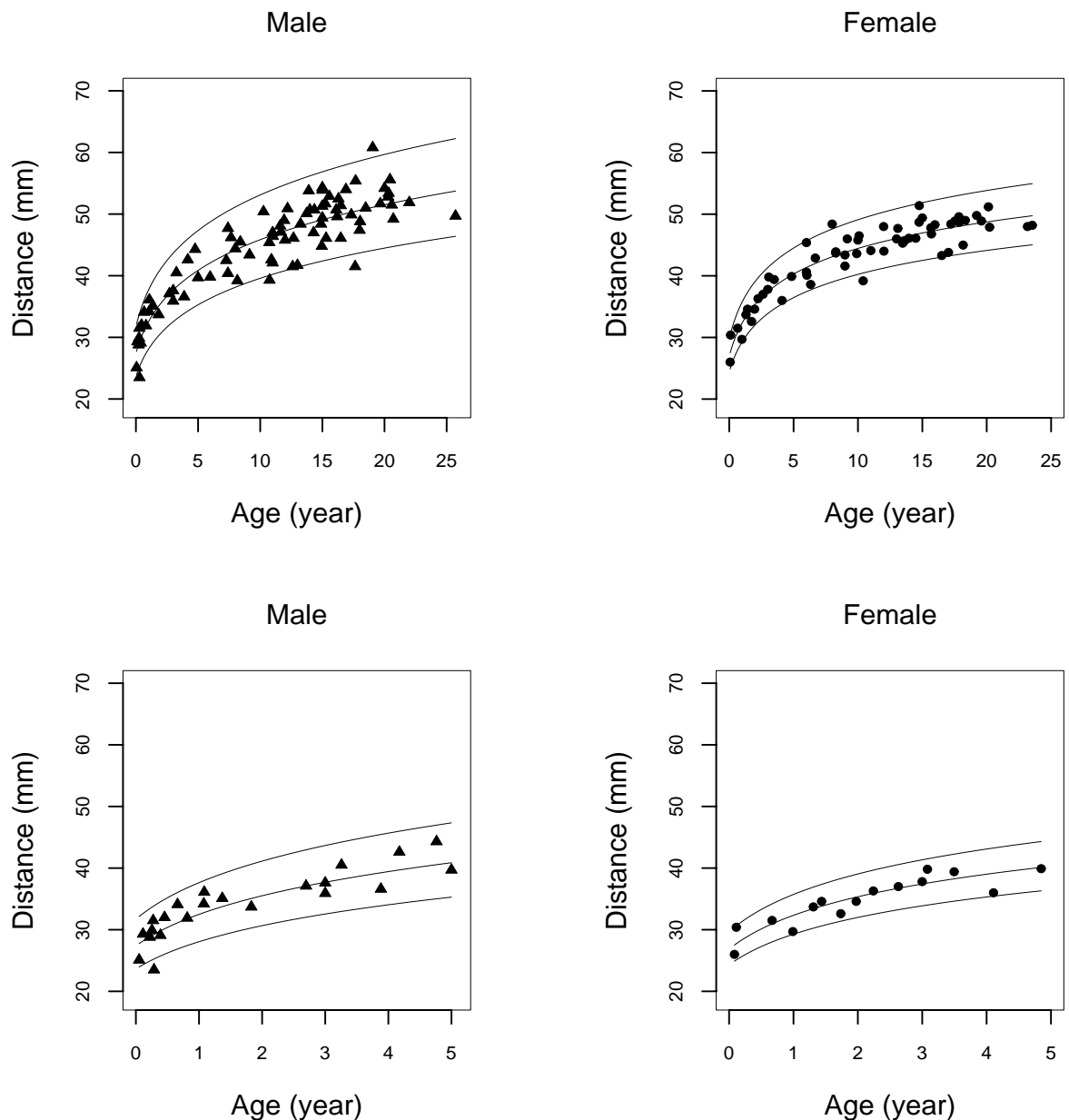
**Right inferior maxillary length (*mxt.r-pr*)**



**Figure 3.72** Graphs of right inferior maxillary length (*mxt.r-pr*) versus age for males and females from birth to adulthood (above) and from birth to age five years (below).

**Table 3.72** Means (M), standard deviations (SD), minimum and maximum values (in mm) for right inferior maxillary length (*mxt.r-pr*) at different age intervals.

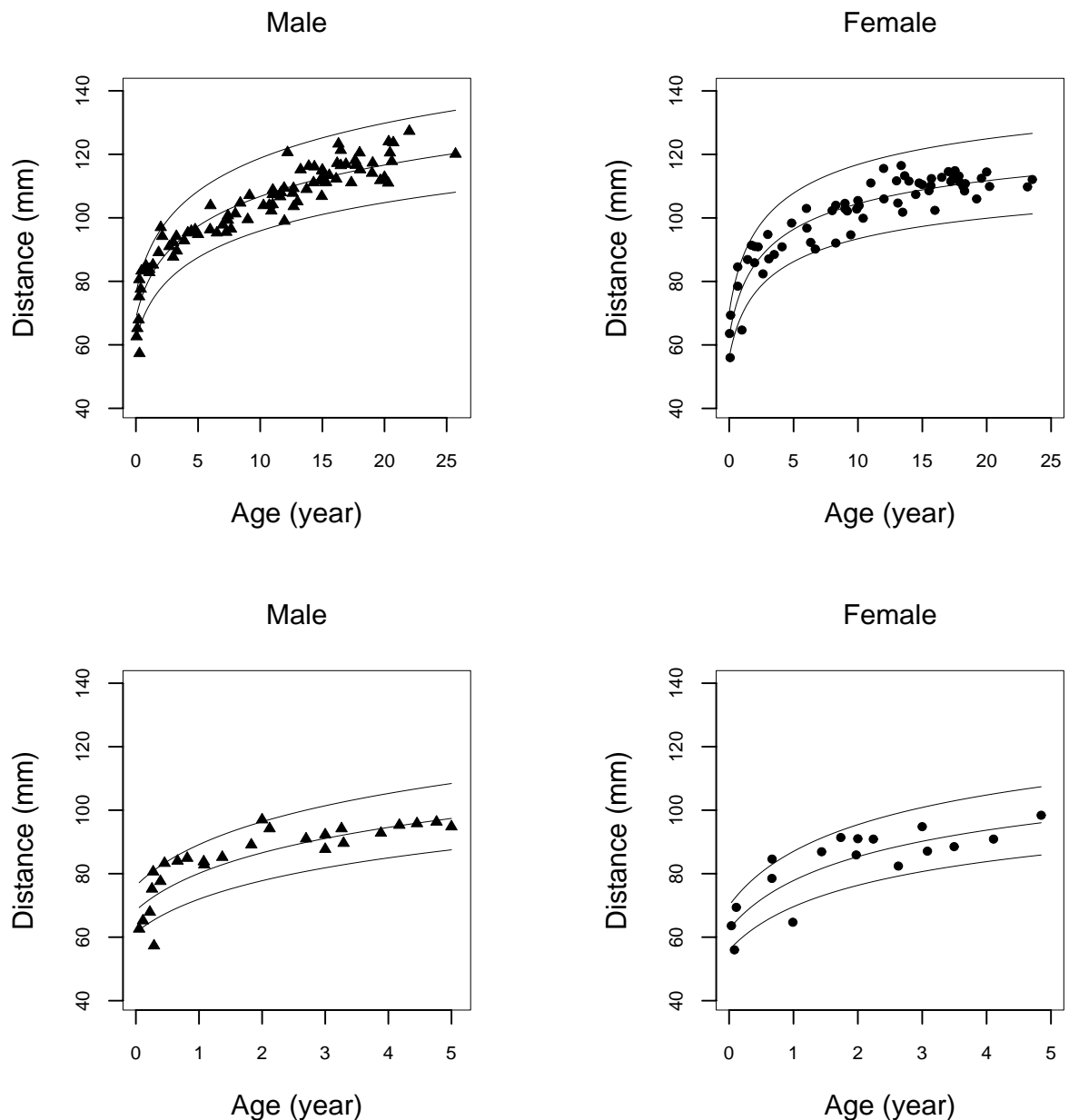
Age group	Males					Females					Total				
	N	M	SD	Min	Max	N	M	SD	Min	Max	N	M	SD	Min	Max
0-1	10	28.2	2.71	21.6	31.7	4	28.2	3.27	24.8	32.6	14	28.2	2.75	21.6	32.6
1-3	6	35.6	1.55	33.5	37.5	7	37.2	2.06	33.7	40.3	13	36.5	1.95	33.5	40.3
3-5	4	40.7	3.24	37.4	45.1	4	39.5	1.05	38.5	40.9	8	40.1	2.32	37.4	45.1
5-10	7	45.9	2.73	41.7	49.3	10	46.2	3.45	39.5	52.6	17	46.1	3.08	39.5	52.6
10-12	8	51.8	3.47	46.7	57.2	4	48.6	3.85	42.9	51.0	12	50.8	3.77	42.9	57.2
12-14	8	54.2	3.53	47.9	58.4	5	53.3	1.36	51.5	54.8	13	53.9	2.84	47.9	58.4
14-16	7	54.0	1.48	51.8	56.6	4	54.3	2.63	51.1	56.5	11	54.1	1.85	51.1	56.6
16-18	9	57.0	2.88	53.7	62.8	5	56.9	3.30	52.4	61.5	14	57.0	2.91	52.4	62.8
18-25	10	60.0	2.48	57.0	64.6	5	56.9	3.65	51.6	61.8	15	59.0	3.16	51.6	64.6

Palatal length (*pns-ans*)

**Figure 3.73** Graphs of palatal length (*pns-ans*) versus age for males and females from birth to adulthood (above) and from birth to age five years (below).

**Table 3.73** Means (M), standard deviations (SD), minimum and maximum values (in mm) for palatal length (*pns-ans*) at different age intervals.

Age group	Males					Females					Total				
	N	M	SD	Min	Max	N	M	SD	Min	Max	N	M	SD	Min	Max
0-1	10	29.5	3.22	23.5	34.1	4	29.4	2.38	26.0	31.5	14	29.5	2.92	23.5	34.1
1-3	7	35.7	1.44	33.7	37.6	7	35.2	1.87	32.6	37.8	14	35.5	1.62	32.6	37.8
3-5	5	40.7	2.93	36.6	44.3	4	38.8	1.86	36.0	39.9	9	39.9	2.58	36.0	44.3
5-10	9	43.2	3.00	39.2	47.7	13	43.4	2.70	38.6	48.4	22	43.3	2.75	38.6	48.4
10-12	11	45.7	3.26	39.3	50.4	4	44.5	3.85	39.2	48.0	15	45.4	3.34	39.2	50.4
12-14	8	47.9	4.46	41.5	53.8	6	45.8	1.20	44.0	47.7	14	47.0	3.53	41.5	53.8
14-16	11	50.0	3.18	44.8	54.3	7	48.4	1.75	46.1	51.4	18	49.4	2.78	44.8	54.3
16-18	10	49.9	4.06	41.5	55.4	6	47.1	2.80	43.3	49.6	16	48.8	3.79	41.5	55.4
18-25	12	52.6	3.29	48.8	60.8	8	48.5	1.79	45.0	51.2	20	50.9	3.40	45.0	60.8

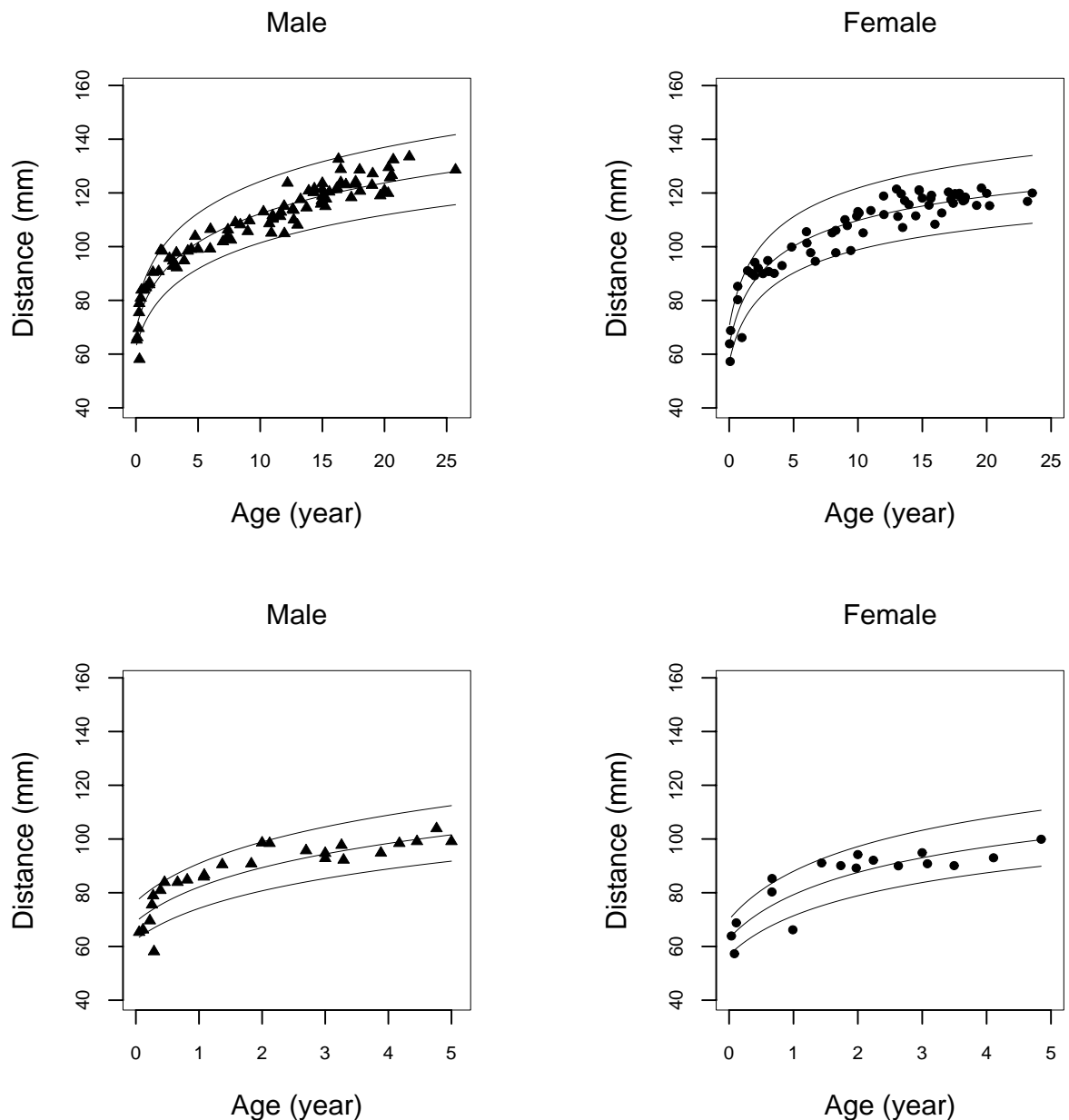
Superior interzygomatic width (*zt.l-zt.r*)

**Figure 3.74** Graphs of superior interzygomatic width (*zt.l-zt.r*) versus age for males and females from birth to adulthood (above) and from birth to age five years (below).

**Table 3.74** Means (M), standard deviations (SD), minimum and maximum values (in mm) for superior interzygomatic width (*zt.l-zt.r*) at different age intervals.

Age group	Males					Females					Total				
	N	M	SD	Min	Max	N	M	SD	Min	Max	N	M	SD	Min	Max
0-1	10	73.9	9.93	57.3	84.9	6	69.5	10.48	56.0	84.6	16	72.2	10.03	56.0	84.9
1-3	9	89.2	4.84	82.8	97.0	7	89.0	4.17	82.4	94.8	16	89.2	4.41	82.4	97.0
3-5	7	94.1	2.30	89.6	96.3	4	91.2	5.03	87.1	98.4	11	93.1	3.59	87.1	98.4
5-10	12	99.8	3.85	95.3	107.1	13	99.5	5.44	90.2	105.5	25	99.7	4.65	90.2	107.1
10-12	10	105.4	3.28	99.0	109.4	4	107.6	7.04	99.9	115.6	14	106.0	4.47	99.0	115.6
12-14	8	110.9	5.91	103.6	120.6	7	109.4	5.28	101.8	116.5	15	110.2	5.48	101.8	120.6
14-16	10	112.4	2.68	106.8	116.1	7	108.9	3.30	102.4	112.4	17	111.0	3.36	102.4	116.1
16-18	10	117.4	3.76	111.1	123.3	7	113.0	1.37	111.4	114.9	17	115.6	3.69	111.1	123.3
18-25	12	118.0	5.25	111.0	127.3	9	110.4	2.45	106.0	114.5	21	114.7	5.67	106.0	127.3

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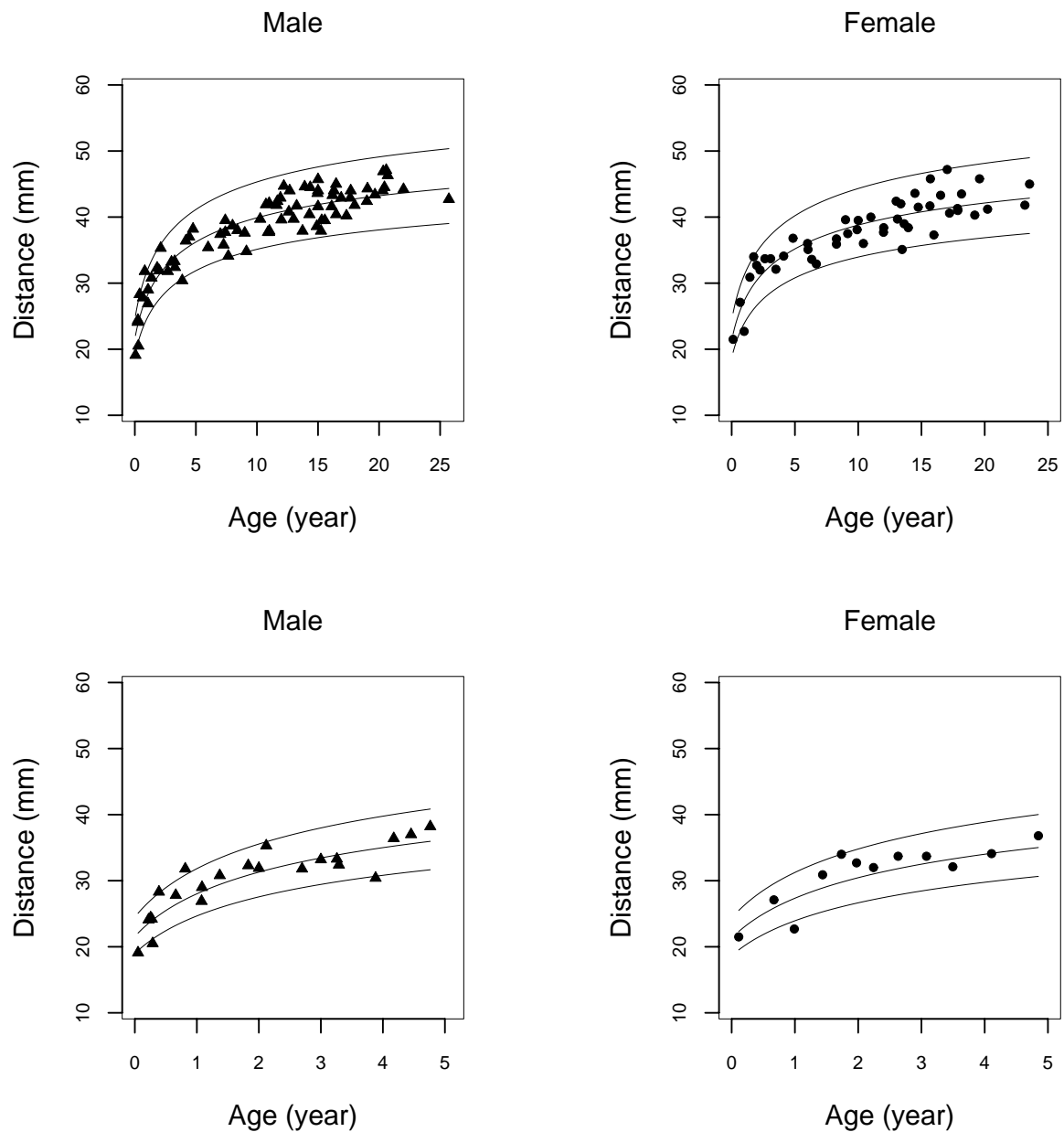
**Inferior interzygomatic width (*zti.l-zti.r*)**


**Figure 3.75** Graphs of inferior interzygomatic width (*zti.l-zti.r*) versus age for males and females from birth to adulthood (above) and from birth to age five years (below).

**Table 3.75** Means (M), standard deviations (SD), minimum and maximum values (in mm) for inferior interzygomatic width (*zti.l-zti.r*) at different age intervals.

Age group	Males					Females					Total				
	N	M	SD	Min	Max	N	M	SD	Min	Max	N	M	SD	Min	Max
0-1	10	74.7	9.37	58.1	84.8	6	70.3	10.53	57.3	85.3	16	73.1	9.72	57.3	85.3
1-3	9	92.7	4.64	85.9	98.6	7	91.7	2.19	89.2	94.9	16	92.2	3.70	85.9	98.6
3-5	7	97.9	3.68	92.2	103.9	4	93.5	4.47	90.1	99.9	11	96.3	4.37	90.1	103.9
5-10	11	105.1	3.28	99.2	109.7	12	104.1	6.03	94.6	113.1	23	104.6	4.82	94.6	113.1
10-12	10	110.4	3.32	104.9	115.1	4	112.6	5.63	105.2	118.9	14	111.0	4.00	104.9	118.9
12-14	8	115.3	5.23	108.1	123.7	7	114.9	5.05	107.2	121.5	15	115.1	4.96	107.2	123.7
14-16	10	119.2	2.72	115.0	123.6	8	116.6	4.55	108.4	121.2	18	118.0	3.77	108.4	123.6
16-18	10	124.6	4.22	118.3	132.6	7	117.9	2.78	112.6	120.4	17	121.9	4.93	112.6	132.6
18-25	12	125.6	4.92	119.0	133.5	9	118.0	2.22	115.3	121.9	21	122.3	5.46	115.3	133.5

**Left zygomatic height (*slor.l-zmi.l*)**



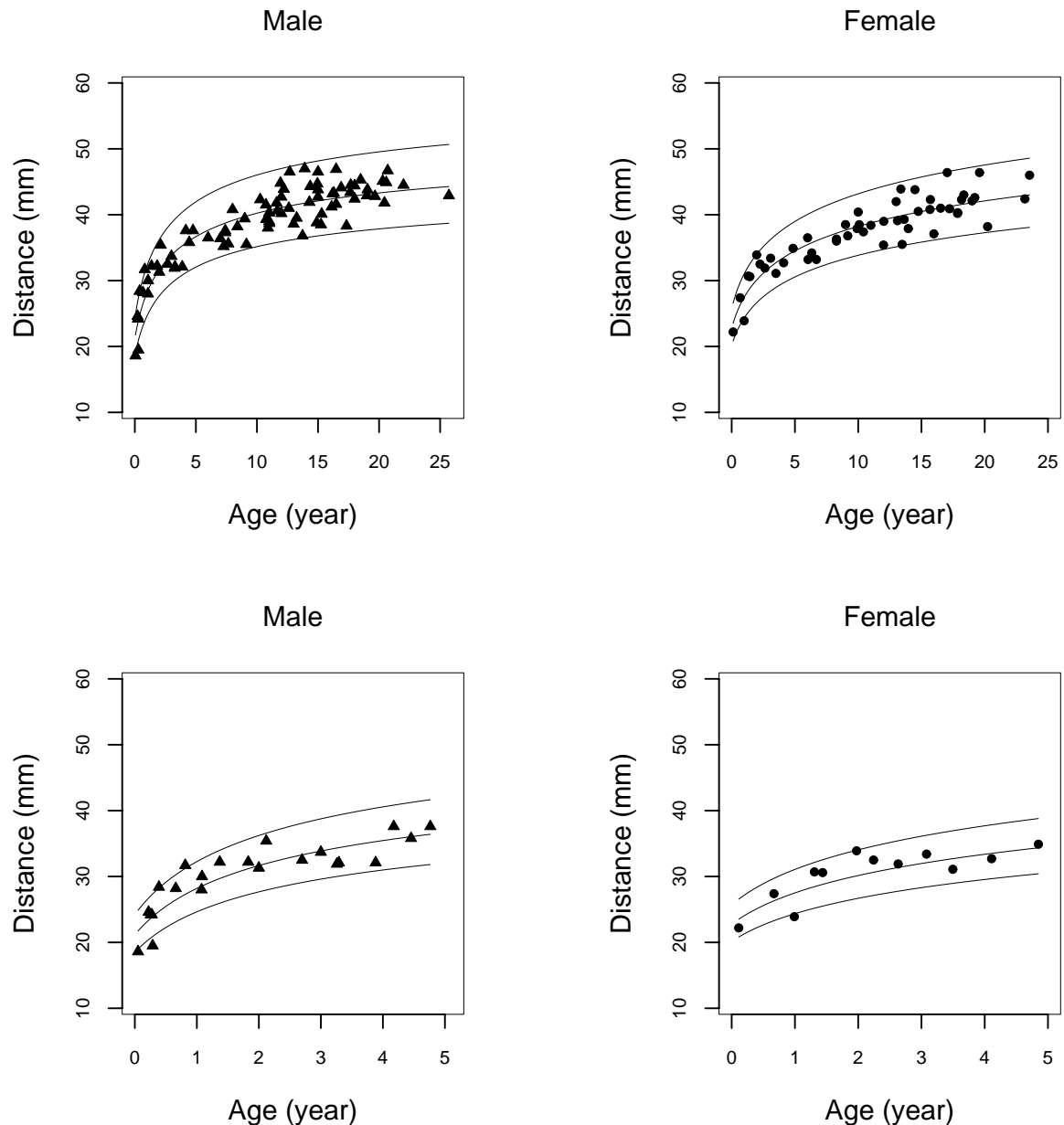
**Figure 3.76** Graphs of left zygomatic height (*slor.l-zmi.l*) versus age for males and females from birth to adulthood (above) and from birth to age five years (below).

**Table 3.76** Means (M), standard deviations (SD), minimum and maximum values (in mm) for left zygomatic height (*slor.l-zmi.l*) at different age intervals.

Age group	Males					Females					Total				
	N	M	SD	Min	Max	N	M	SD	Min	Max	N	M	SD	Min	Max
0-1	8	25.0	4.17	19.1	31.8	3	23.8	2.95	21.5	27.1	11	24.7	3.78	19.1	31.8
1-3	8	31.4	2.56	26.9	35.3	5	32.7	1.27	30.9	34.0	13	31.9	2.19	26.9	35.3
3-5	6	34.6	3.04	30.4	38.2	4	34.2	1.95	32.1	36.8	10	34.4	2.54	30.4	38.2
5-10	10	36.9	1.77	34.1	39.5	10	36.5	2.26	32.9	39.6	20	36.7	1.99	32.9	39.6
10-12	10	40.4	2.09	37.7	42.9	3	37.9	2.01	36.0	40.0	13	39.8	2.26	36.0	42.9
12-14	7	41.9	2.63	37.9	44.7	7	39.3	2.46	35.1	42.4	14	40.6	2.80	35.1	44.7
14-16	10	41.5	2.75	37.9	45.7	5	42.0	3.14	37.3	45.8	15	41.7	2.78	37.3	45.8
16-18	10	42.6	1.58	40.2	45.0	5	42.7	2.73	40.6	47.2	15	42.6	1.94	40.2	47.2
18-25	10	44.6	1.66	42.4	47.1	6	42.9	2.19	40.3	45.8	16	44.0	1.99	40.3	47.1



**Right zygomatic height (*slor.r-zmi.r*)**

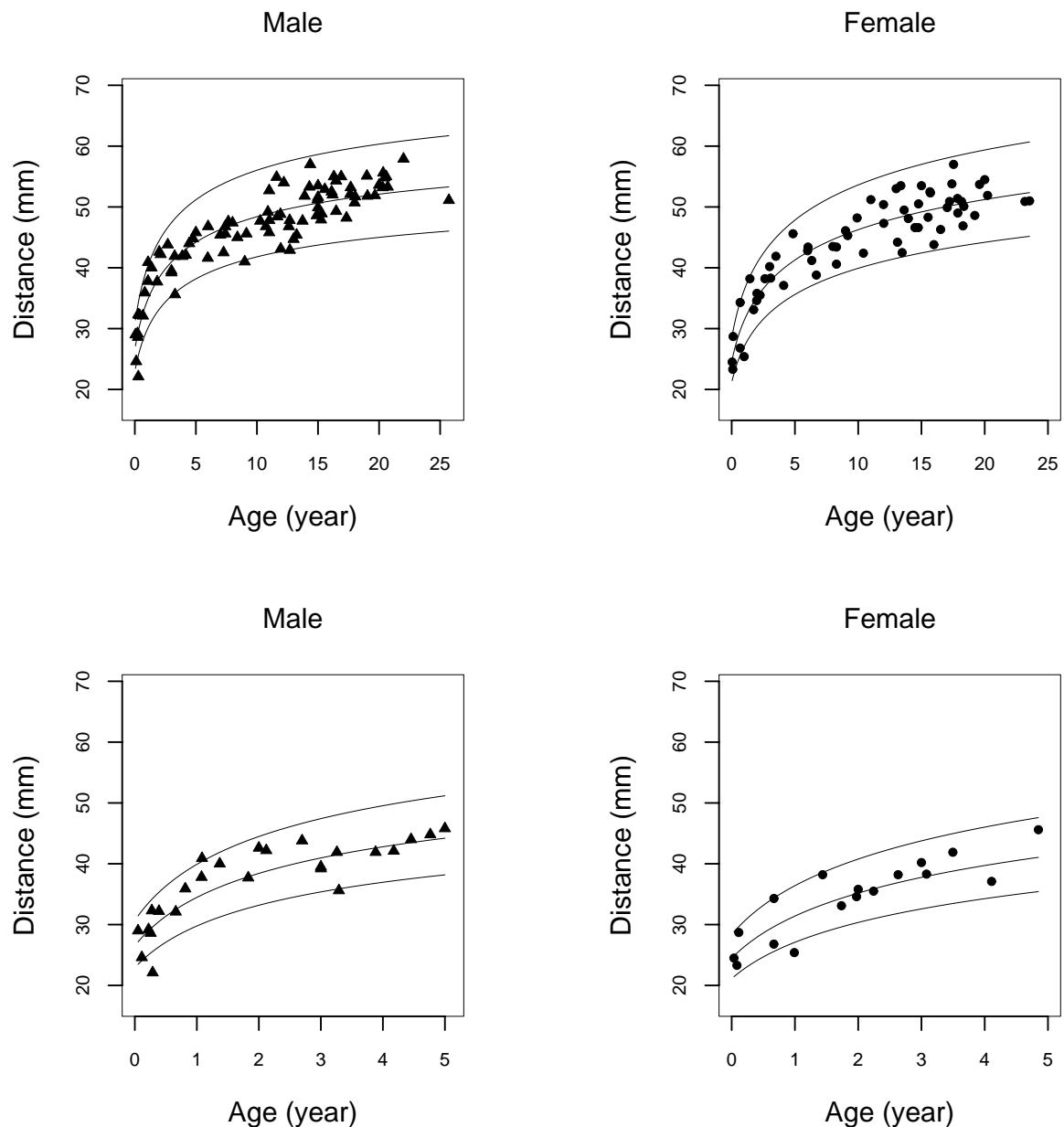


**Figure 3.77** Graphs of right zygomatic height (*slor.r-zmi.r*) versus age for males and females from birth to adulthood (above) and from birth to age five years (below).

**Table 3.77** Means (M), standard deviations (SD), minimum and maximum values (in mm) for right zygomatic height (*slor.r-zmi.r*) at different age intervals.

Age group	Males					Females					Total				
	N	M	SD	Min	Max	N	M	SD	Min	Max	N	M	SD	Min	Max
0-1	8	24.9	4.46	18.6	31.7	3	24.5	2.65	22.2	27.4	11	24.8	3.92	18.6	31.7
1-3	8	31.9	2.24	28.0	35.4	5	31.9	1.37	30.6	33.9	13	31.9	1.89	28.0	35.4
3-5	6	34.5	2.80	31.9	37.6	4	33.0	1.58	31.1	34.9	10	33.9	2.40	31.1	37.6
5-10	10	37.3	1.81	35.2	40.8	10	36.3	2.31	33.2	40.4	20	36.8	2.08	33.2	40.8
10-12	12	40.8	1.95	38.0	44.8	4	37.4	1.44	35.4	38.5	16	39.9	2.33	35.4	44.8
12-14	7	41.9	3.97	36.8	47.0	7	39.5	2.73	35.5	43.9	14	40.7	3.50	35.5	47.0
14-16	9	42.4	2.77	38.5	46.5	5	40.9	2.50	37.1	43.8	14	41.8	2.68	37.1	46.5
16-18	11	43.0	2.20	38.3	46.9	5	41.8	2.62	40.2	46.4	16	42.6	2.33	38.3	46.9
18-25	10	44.1	1.49	41.8	46.7	8	42.9	2.54	38.2	46.4	18	43.5	2.05	38.2	46.7

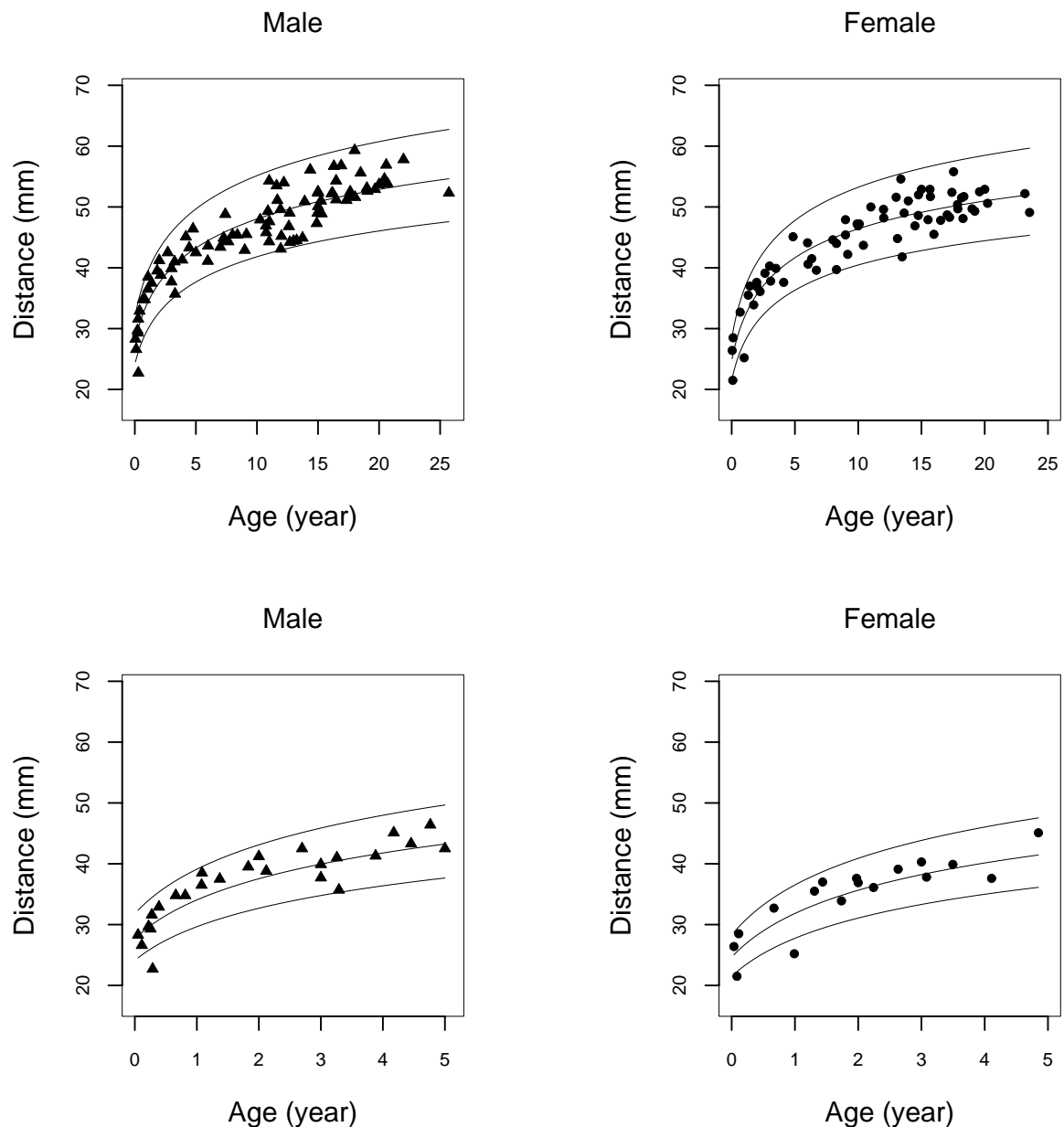
### Left zygomatic length (*zti.l-or.l*)



**Figure 3.78** Graphs of left zygomatic length (*zti.l-or.l*) versus age for males and females from birth to adulthood (above) and from birth to age five years (below).

**Table 3.78** Means (M), standard deviations (SD), minimum and maximum values (in mm) for left zygomatic length (*zti.l-or.l*) at different age intervals.

Age group	Males					Females					Total				
	N	M	SD	Min	Max	N	M	SD	Min	Max	N	M	SD	Min	Max
0-1	9	29.6	4.22	22.1	35.9	6	27.2	3.96	23.3	34.3	15	28.6	4.16	22.1	35.9
1-3	9	40.4	2.13	37.7	43.8	7	36.5	2.45	33.1	40.2	16	38.7	2.97	33.1	43.8
3-5	7	42.3	3.33	35.6	45.8	4	40.7	3.84	37.1	45.6	11	41.7	3.42	35.6	45.8
5-10	11	45.0	2.32	41.0	47.6	10	43.3	2.75	38.8	48.2	21	44.2	2.62	38.8	48.2
10-12	10	48.5	3.33	43.1	54.9	3	48.0	4.87	42.4	51.2	13	48.4	3.51	42.4	54.9
12-14	8	47.6	3.68	42.9	54.0	7	48.3	4.12	42.5	53.5	15	47.9	3.76	42.5	54.0
14-16	10	51.5	2.79	47.9	57.0	8	49.3	3.47	43.8	53.5	18	50.5	3.22	43.8	57.0
16-18	10	52.2	2.31	48.2	55.0	7	51.2	3.44	46.3	57.0	17	51.8	2.78	46.3	57.0
18-25	12	53.8	2.00	51.1	57.9	9	50.9	2.34	46.9	54.5	21	52.5	2.53	46.9	57.9

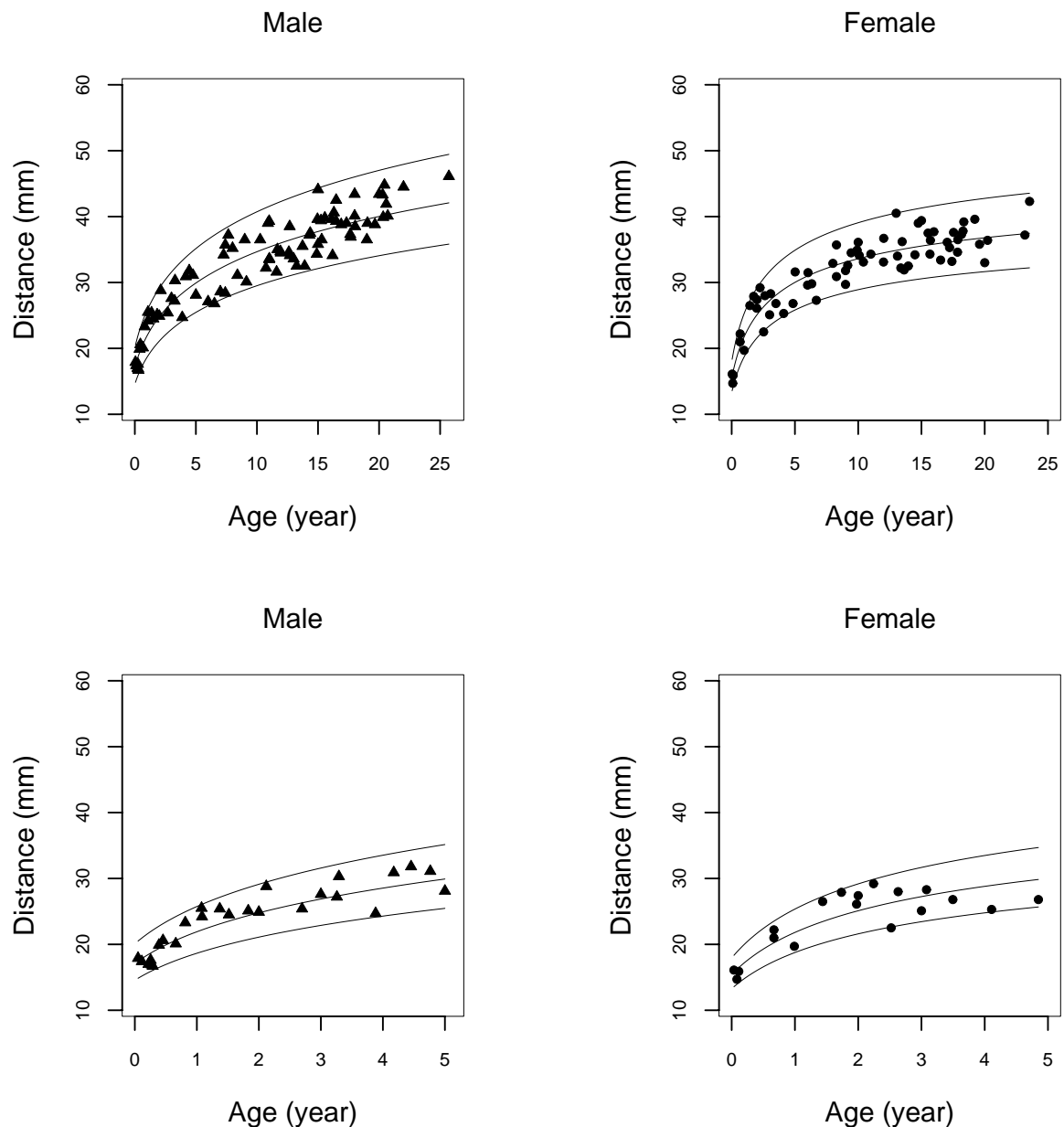
Right zygomatic length (*zti.r-or.r*)

**Figure 3.79** Graphs of right zygomatic length (*zti.r-or.r*) versus age for males and females from birth to adulthood (above) and from birth to age five years (below).

**Table 3.79** Means (M), standard deviations (SD), minimum and maximum values (in mm) for right zygomatic length (*zti.r-or.r*) at different age intervals.

Age group	Males					Females					Total				
	N	M	SD	Min	Max	N	M	SD	Min	Max	N	M	SD	Min	Max
0-1	9	30.1	3.96	22.7	34.8	5	26.9	4.14	21.5	32.7	14	28.9	4.18	21.5	34.8
1-3	9	39.1	1.89	36.5	42.5	8	37.1	2.01	33.9	40.3	17	38.1	2.17	33.9	42.5
3-5	7	42.2	3.46	35.7	46.4	4	40.1	3.49	37.6	45.1	11	41.4	3.46	35.7	46.4
5-10	11	44.5	1.93	41.1	48.8	12	43.6	2.92	39.6	47.9	23	44.1	2.48	39.6	48.8
10-12	12	48.2	3.50	43.1	54.3	4	47.6	2.89	43.7	50.0	16	48.1	3.28	43.1	54.3
12-14	8	47.3	3.64	44.2	54.0	7	48.7	4.31	41.8	54.6	15	48.0	3.89	41.8	54.6
14-16	9	51.1	2.62	47.3	56.1	8	49.8	2.92	45.5	52.9	17	50.5	2.75	45.5	56.1
16-18	10	53.8	2.83	51.1	59.3	7	50.4	2.82	47.8	55.8	17	52.4	3.23	47.8	59.3
18-25	12	54.1	1.87	51.6	57.8	10	50.8	1.64	48.1	52.9	22	52.6	2.41	48.1	57.8

**Left zygomatic arch length (*zt.l-au.l*)**

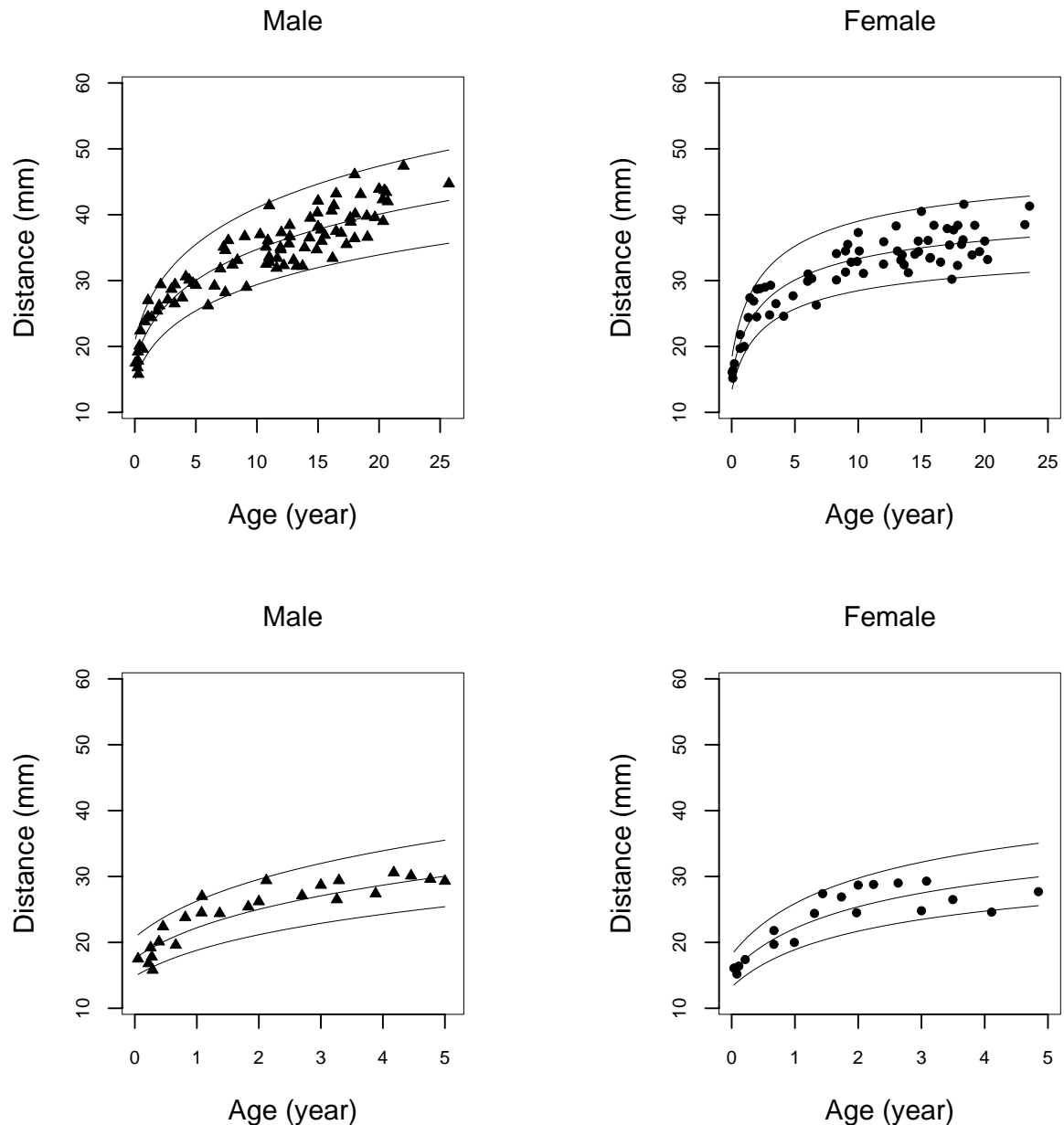


**Figure 3.80** Graphs of left zygomatic arch length (*zt.l-au.l*) versus age for males and females from birth to adulthood (above) and from birth to age five years (below).

**Table 3.80** Means (M), standard deviations (SD), minimum and maximum values (in mm) for left zygomatic arch length (*zt.l-au.l*) at different age intervals.

Age group	Males					Females					Total				
	N	M	SD	Min	Max	N	M	SD	Min	Max	N	M	SD	Min	Max
0-1	10	18.7	2.16	16.7	23.3	6	18.3	3.10	14.7	22.2	16	18.6	2.46	14.7	23.3
1-3	9	25.7	1.51	24.2	28.8	8	26.6	2.08	22.5	29.2	17	26.1	1.80	22.5	29.2
3-5	7	29.2	2.58	24.7	31.8	4	26.8	1.22	25.3	28.3	11	28.3	2.42	24.7	31.8
5-10	11	31.9	3.95	26.8	37.2	14	32.1	2.57	27.3	36.1	25	32.0	3.18	26.8	37.2
10-12	10	35.0	2.60	31.6	39.3	4	33.7	0.64	33.1	34.3	14	34.6	2.27	31.6	39.3
12-14	7	34.5	2.08	32.5	38.5	7	34.9	3.14	31.9	40.5	14	34.7	2.57	31.9	40.5
14-16	9	38.2	2.87	34.3	44.1	7	36.9	2.08	34.2	39.4	16	37.7	2.57	34.2	44.1
16-18	11	39.2	2.58	34.1	43.4	7	35.2	1.63	33.2	37.6	18	37.7	2.98	33.2	43.4
18-25	12	41.4	3.02	36.5	46.1	9	37.6	2.62	33.0	42.3	21	39.8	3.38	33.0	46.1

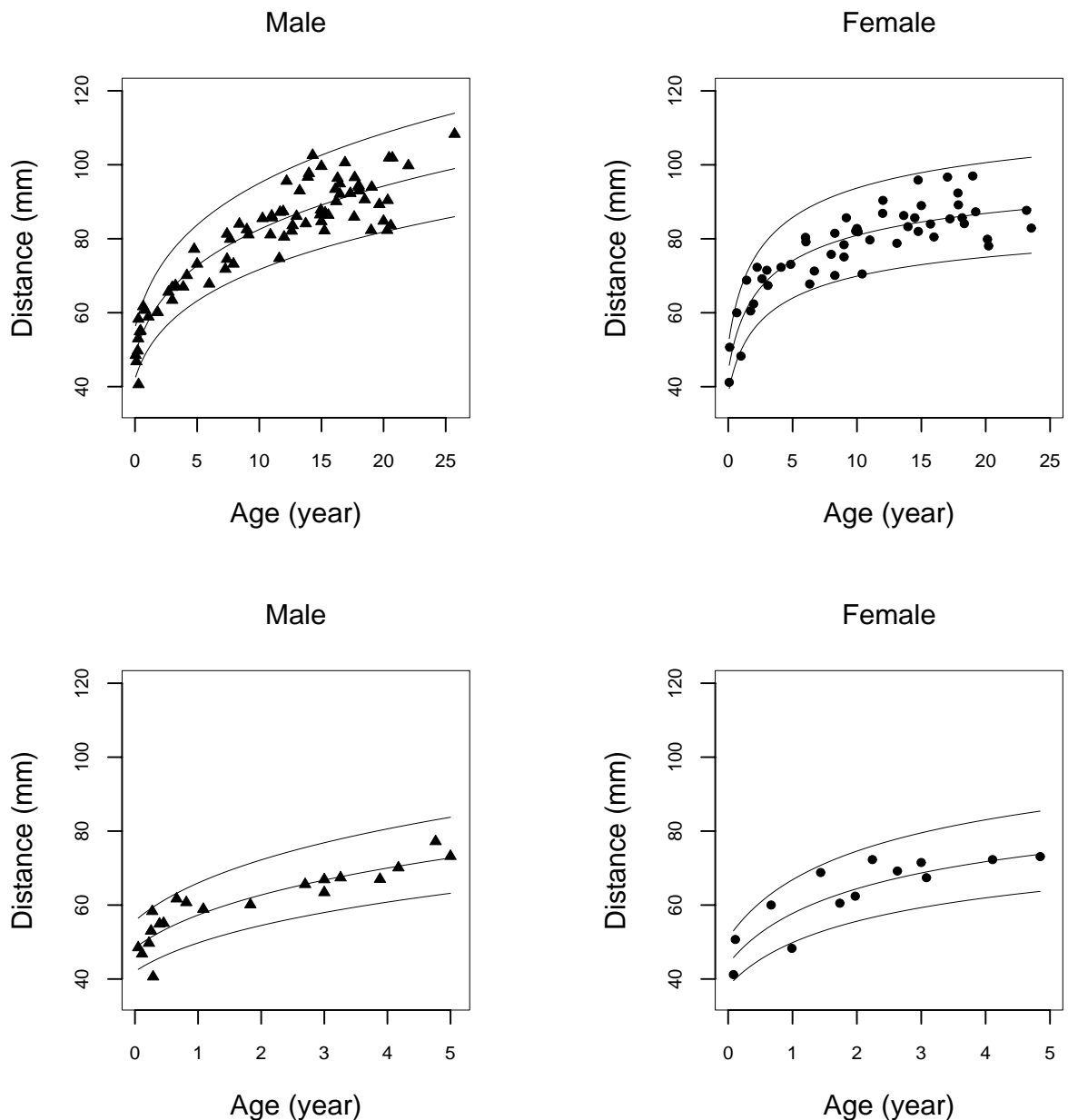
**Right zygomatic arch length (*zt.r-au.r*)**



**Figure 3.81** Graphs of right zygomatic arch length (*zt.r-au.r*) versus age for males and females from birth to adulthood (above) and from birth to age five years (below).

**Table 3.81** Means (M), standard deviations (SD), minimum and maximum values (in mm) for right zygomatic arch length (*zt.r-au.r*) at different age intervals.

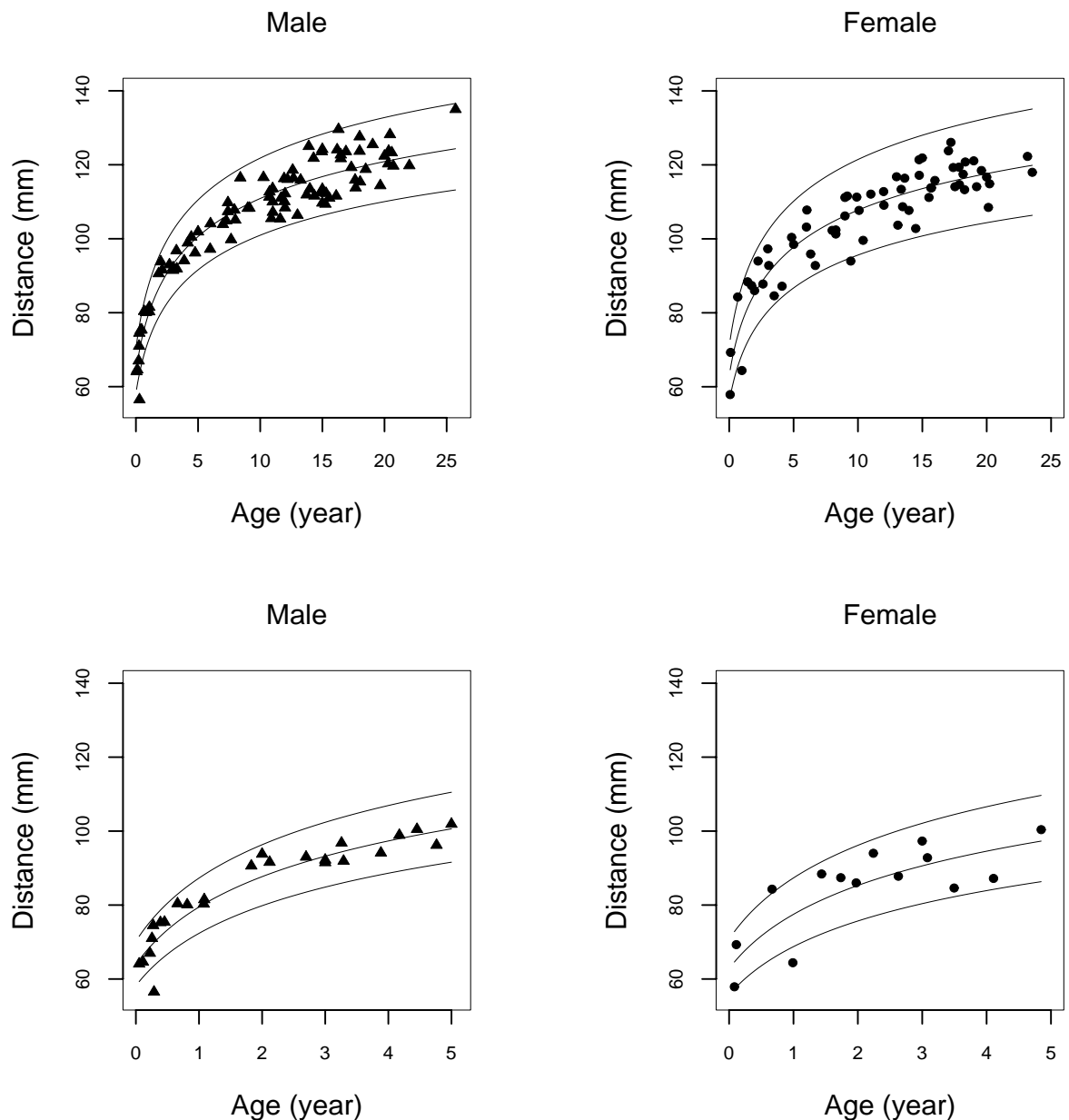
Age group	Males					Females					Total				
	N	M	SD	Min	Max	N	M	SD	Min	Max	N	M	SD	Min	Max
0-1	9	19.2	2.61	15.8	23.8	7	18.1	2.44	15.2	21.8	16	18.7	2.52	15.2	23.8
1-3	8	26.6	1.83	24.4	29.4	8	26.8	2.00	24.4	29.0	16	26.7	1.85	24.4	29.4
3-5	7	29.0	1.48	26.5	30.6	4	27.0	1.98	24.6	29.3	11	28.3	1.86	24.6	30.6
5-10	11	32.0	3.49	26.2	36.7	12	32.2	2.97	26.3	37.3	23	32.1	3.15	26.2	37.3
10-12	12	35.1	2.64	31.9	41.4	3	32.7	1.71	31.1	34.5	15	34.6	2.62	31.1	41.4
12-14	8	34.4	2.36	32.2	38.4	7	34.2	2.36	31.2	38.3	15	34.3	2.27	31.2	38.4
14-16	9	38.0	2.31	34.7	42.1	8	35.8	2.54	33.4	40.5	17	37.0	2.61	33.4	42.1
16-18	11	39.1	3.64	33.4	46.1	7	35.0	3.23	30.2	38.4	18	37.5	3.96	30.2	46.1
18-25	13	42.0	2.87	36.6	47.4	10	36.9	2.95	33.2	41.6	23	39.8	3.83	33.2	47.4

Intergonial width (*go.l-go.r*)

**Figure 3.82** Graphs of intergonial width (*go.l-go.r*) versus age for males and females from birth to adulthood (above) and from birth to age five years (below).

**Table 3.82** Means (M), standard deviations (SD), minimum and maximum values (in mm) for intergonial width (*go.l-go.r*) at different age intervals.

Age group	Males					Females					Total				
	N	M	SD	Min	Max	N	M	SD	Min	Max	N	M	SD	Min	Max
0-1	10	52.9	6.62	40.6	61.7	4	50.1	7.76	41.2	60.0	14	52.1	6.79	40.6	61.7
1-3	5	63.0	3.44	58.9	66.9	6	67.5	4.87	60.5	72.3	11	65.4	4.70	58.9	72.3
3-5	5	71.0	4.27	67.0	77.2	3	70.9	3.09	67.4	73.1	8	71.0	3.63	67.0	77.2
5-10	9	77.3	5.64	67.8	84.0	12	77.5	5.56	67.8	85.7	21	77.4	5.45	67.8	85.7
10-12	8	83.5	4.43	74.7	87.4	4	79.8	6.86	70.5	86.9	12	82.3	5.37	70.5	87.4
12-14	8	89.9	6.52	82.1	97.7	4	84.7	4.89	78.8	90.4	12	88.1	6.33	78.8	97.7
14-16	8	89.6	7.34	82.2	102.6	6	86.2	5.61	80.5	95.9	14	88.1	6.65	80.5	102.6
16-18	11	93.7	3.79	85.9	100.6	4	90.9	4.80	85.4	96.7	15	93.0	4.10	85.4	100.6
18-25	13	92.5	8.40	82.3	108.3	8	85.3	5.79	78.1	97.0	21	89.8	8.17	78.1	108.3

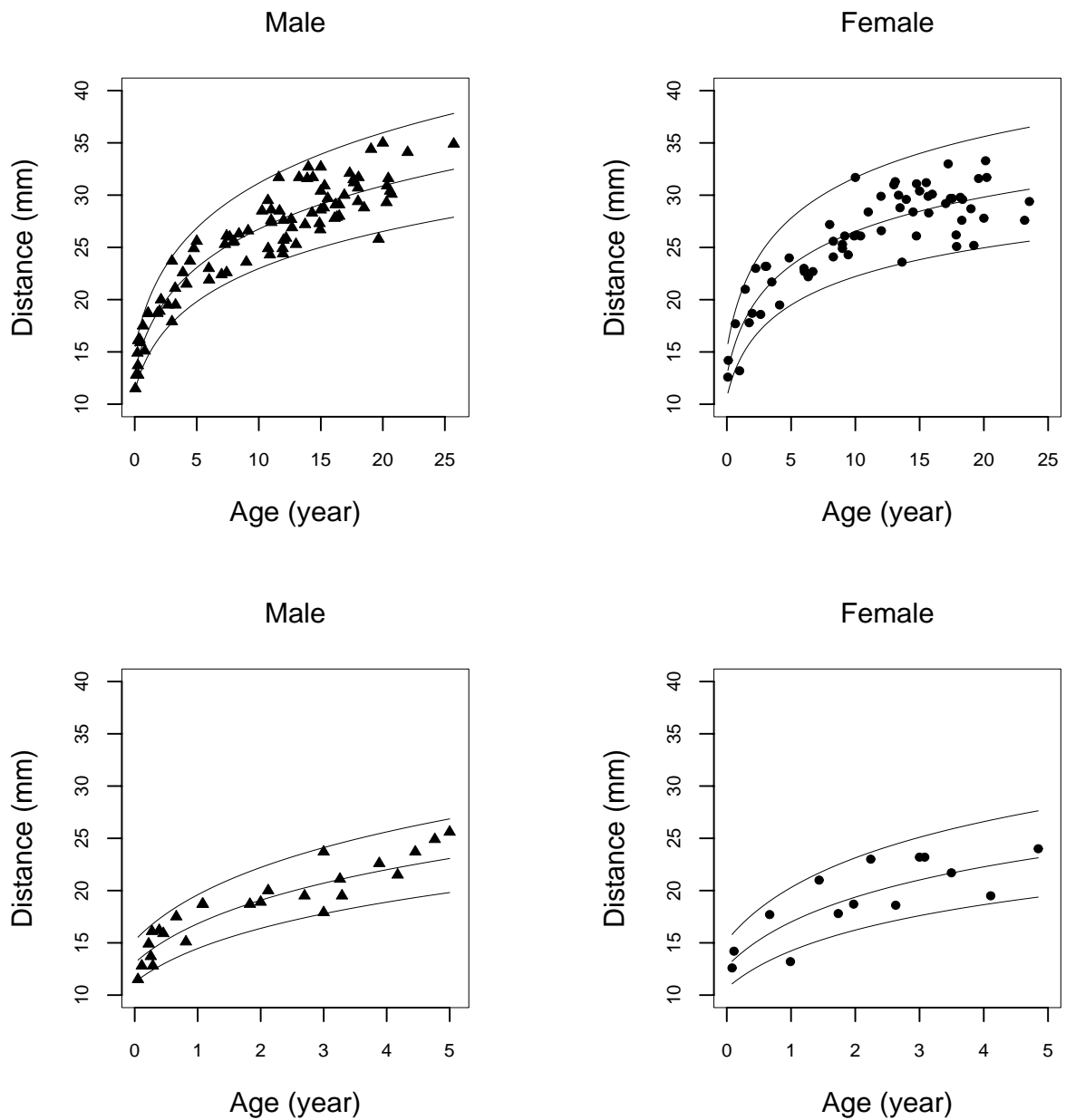
Intercondylar width (*cd.l-cd.r*)

**Figure 3.83** Graphs of intercondylar width (*cd.l-cd.r*) versus age for males and females from birth to adulthood (above) and from birth to age five years (below).

**Table 3.83** Means (M), standard deviations (SD), minimum and maximum values (in mm) for intercondylar width (*cd.l-cd.r*) at different age intervals.

Age group	Males					Females					Total				
	N	M	SD	Min	Max	N	M	SD	Min	Max	N	M	SD	Min	Max
0-1	10	70.9	7.72	56.5	80.4	4	69.0	11.23	57.9	84.3	14	70.3	8.44	56.5	84.3
1-3	8	89.3	5.29	80.3	93.8	6	90.2	4.46	86.0	97.3	14	89.7	4.79	80.3	97.3
3-5	7	97.2	3.53	91.9	101.9	4	91.3	6.99	84.6	100.4	11	95.0	5.58	84.6	101.9
5-10	12	106.1	4.92	97.2	116.5	13	103.0	6.47	92.8	111.6	25	104.5	5.88	92.8	116.5
10-12	13	110.8	3.59	105.4	116.6	4	108.1	6.07	99.6	112.8	17	110.1	4.24	99.6	116.6
12-14	8	115.5	5.36	106.4	125.0	7	110.8	4.86	103.7	116.8	15	113.3	5.50	103.7	125.0
14-16	10	115.0	5.85	109.4	124.2	8	114.7	6.09	102.8	121.9	18	114.9	5.78	102.8	124.2
16-18	11	121.2	5.60	111.6	129.6	6	119.6	4.78	114.1	126.1	17	120.6	5.23	111.6	129.6
18-25	12	122.2	5.63	114.4	135.0	11	116.9	4.02	108.5	122.3	23	119.7	5.53	108.5	135.0

**Left superior ramus distance (*cd.l-ctl*)**



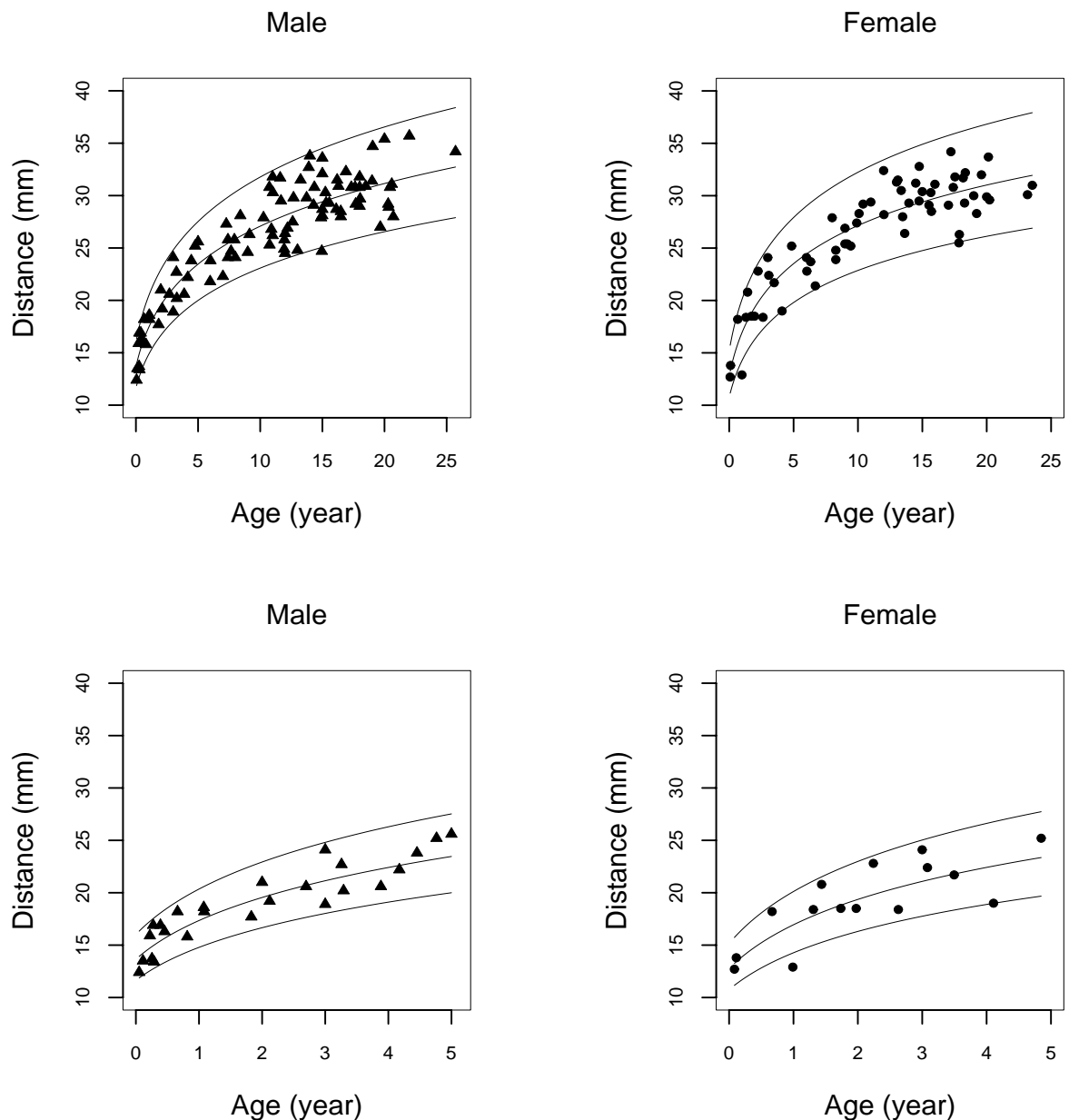
**Figure 3.84** Graphs of left superior ramus distance (*cd.l-ctl*) versus age for males and females from birth to adulthood (above) and from birth to age five years (below).

**Table 3.84** Means (M), standard deviations (SD), minimum and maximum values (in mm) for left superior ramus distance (*cd.l-ctl*) at different age intervals.

Age group	Males					Females					Total				
	N	M	SD	Min	Max	N	M	SD	Min	Max	N	M	SD	Min	Max
0-1	10	14.7	1.89	11.5	17.5	4	14.4	2.28	12.6	17.7	14	14.6	1.92	11.5	17.7
1-3	8	19.5	1.80	17.9	23.7	6	20.4	2.36	17.8	23.2	14	19.9	2.02	17.8	23.7
3-5	7	22.7	2.18	19.5	25.6	4	22.1	1.98	19.5	24.0	11	22.5	2.03	19.5	25.6
5-10	12	24.6	1.73	21.9	26.6	13	25.1	2.52	22.2	31.7	25	24.8	2.15	21.9	31.7
10-12	13	27.2	2.24	24.3	31.7	4	27.7	1.84	26.1	29.9	17	27.3	2.11	24.3	31.7
12-14	8	28.6	2.91	25.3	32.7	7	28.7	2.74	23.6	31.3	15	28.7	2.73	23.6	32.7
14-16	10	29.5	1.92	26.7	32.7	8	29.4	1.73	26.1	31.2	18	29.5	1.79	26.1	32.7
16-18	11	29.7	1.51	27.8	32.1	6	28.8	2.82	25.1	33.0	17	29.4	2.03	25.1	33.0
18-25	12	31.4	2.81	25.8	35.0	11	29.3	2.29	25.2	33.3	23	30.4	2.74	25.2	35.0



**Right superior ramus distance (*cd.r-ctr*)**

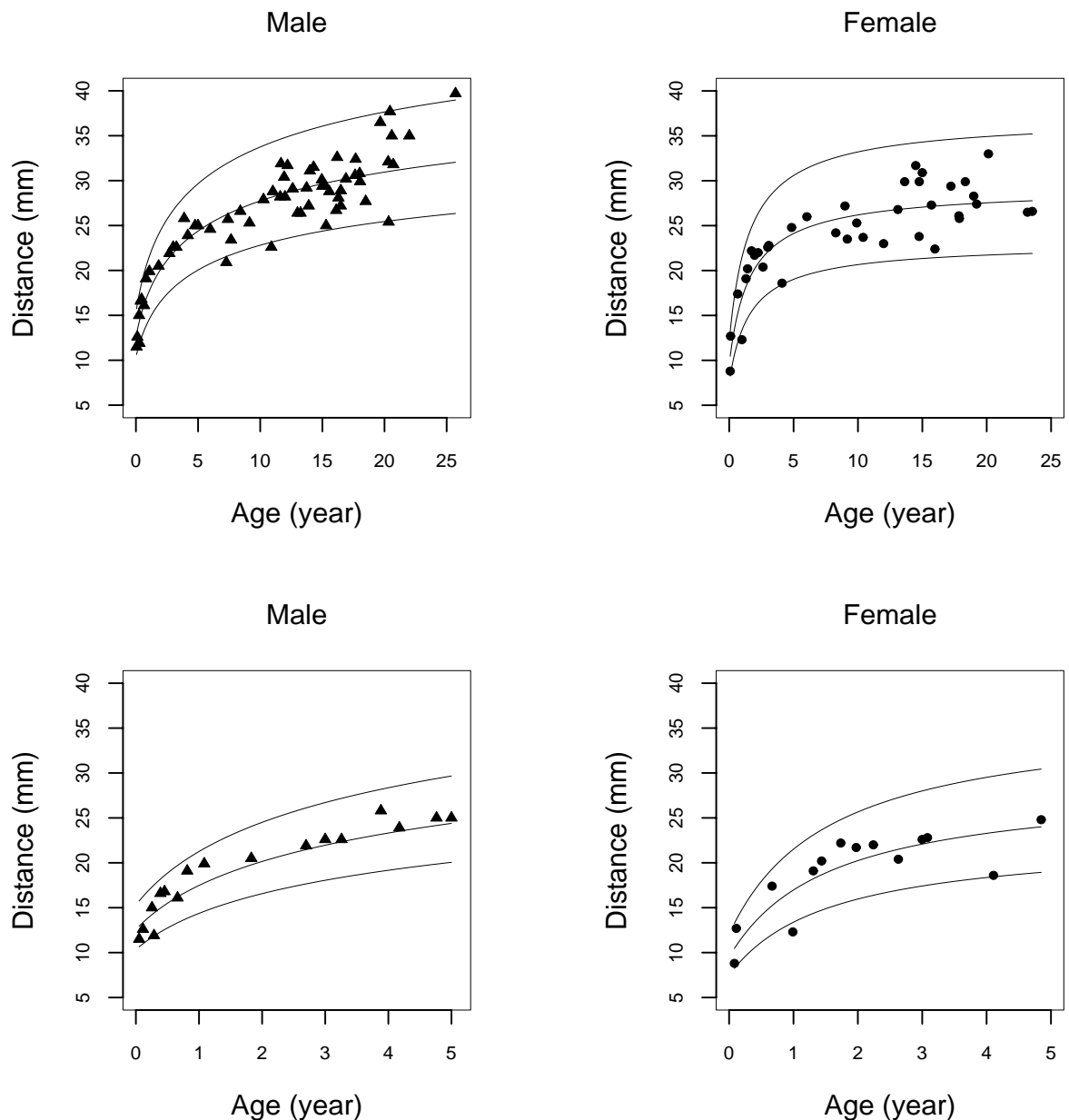


**Figure 3.85** Graphs of right superior ramus distance (*cd.r-ctr*) versus age for males and females from birth to adulthood (above) and from birth to age five years (below).

**Table 3.85** Means (M), standard deviations (SD), minimum and maximum values (in mm) for right superior ramus distance (*cd.r-ctr*) at different age intervals.

Age group	Males					Females					Total				
	N	M	SD	Min	Max	N	M	SD	Min	Max	N	M	SD	Min	Max
0-1	10	15.3	1.91	12.4	18.2	4	14.4	2.58	12.7	18.2	14	15.0	2.06	12.4	18.2
1-3	8	19.8	2.08	17.7	24.1	7	20.2	2.40	18.4	24.1	15	20.0	2.16	17.7	24.1
3-5	7	22.9	2.10	20.2	25.6	4	22.1	2.55	19.0	25.2	11	22.6	2.18	19.0	25.6
5-10	12	24.9	1.87	21.8	28.1	12	24.9	1.90	21.4	27.9	24	24.9	1.84	21.4	28.1
10-12	13	27.8	2.65	24.5	31.8	4	29.8	1.78	28.3	32.4	17	28.3	2.57	24.5	32.4
12-14	8	29.6	3.06	24.8	33.8	7	29.3	1.90	26.4	31.5	15	29.5	2.50	24.8	33.8
14-16	11	29.4	2.33	24.7	33.6	8	30.4	1.36	28.5	32.8	19	29.8	1.99	24.7	33.6
16-18	12	30.2	1.43	28.0	32.3	6	29.6	3.33	25.5	34.2	18	30.0	2.16	25.5	34.2
18-25	13	31.3	2.87	27.0	35.7	11	30.7	1.56	28.3	33.7	24	31.0	2.33	27.0	35.7

### Anterior mandibular alveolar height (*gn-id*)

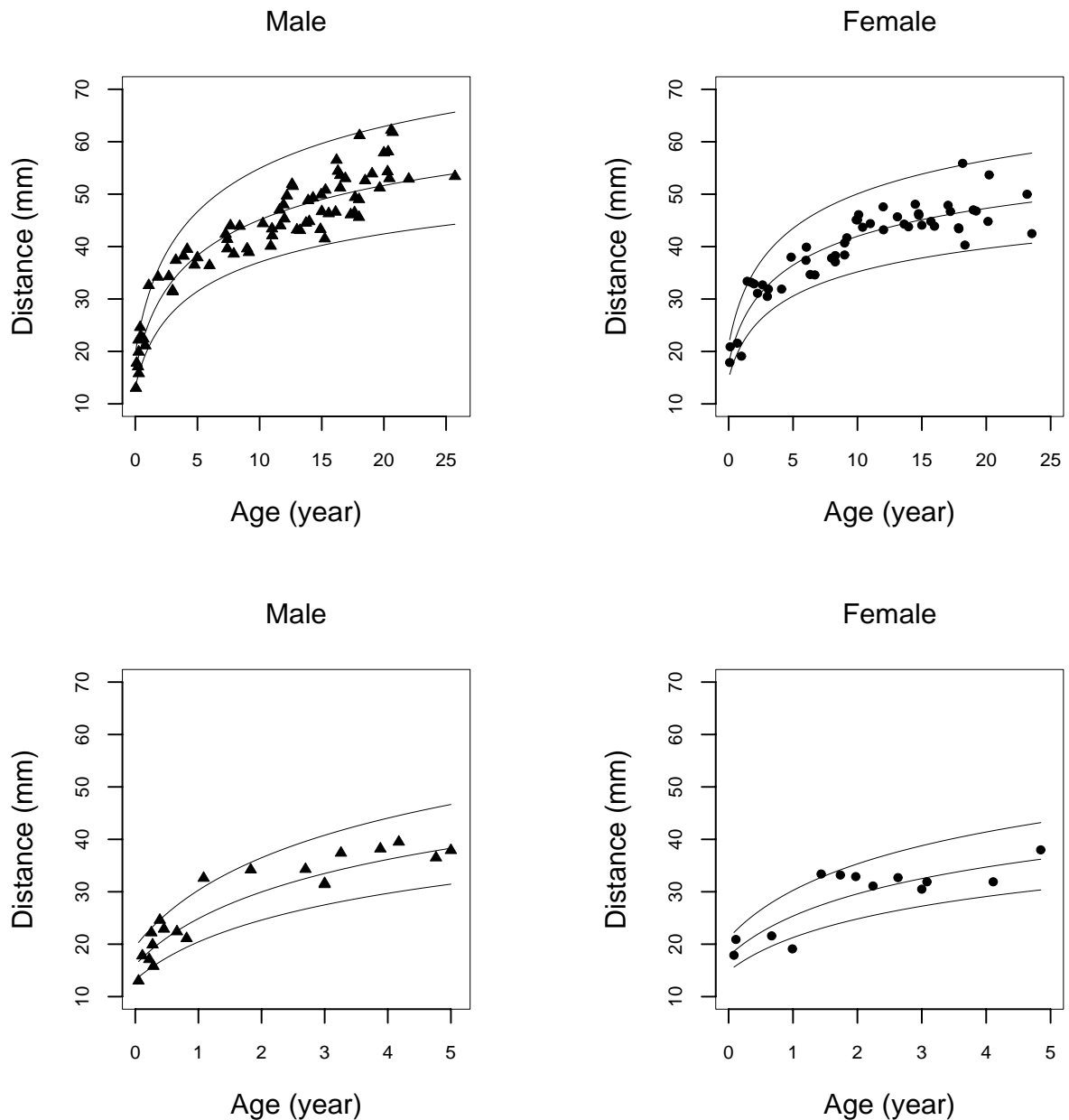


**Figure 3.86** Graphs of anterior mandibular alveolar height (*gn-id*) versus age for males and females from birth to adulthood (above) and from birth to age five years (below).

**Table 3.86** Means (M), standard deviations (SD), minimum and maximum values (in mm) for anterior mandibular alveolar height (*gn-id*) at different age intervals.

Age group	Males					Females					Total				
	N	M	SD	Min	Max	N	M	SD	Min	Max	N	M	SD	Min	Max
0-1	8	15.0	2.71	11.5	19.1	4	12.8	3.53	8.8	17.4	12	14.2	3.03	8.8	19.1
1-3	4	21.2	1.24	19.9	22.6	7	21.2	1.28	19.1	22.6	11	21.2	1.21	19.1	22.6
3-5	5	24.5	1.24	22.6	25.8	3	22.1	3.16	18.6	24.8	8	23.6	2.30	18.6	25.8
5-10	6	24.4	2.03	20.9	26.6	5	25.2	1.46	23.5	27.2	11	24.8	1.76	20.9	27.2
10-12	7	28.3	2.90	22.6	31.9	2	23.4	0.49	23.0	23.7	9	27.2	3.32	22.6	31.9
12-14	7	28.7	2.16	26.4	31.7	2	28.4	2.19	26.8	29.9	9	28.6	2.03	26.4	31.7
14-16	6	29.0	2.18	25.0	31.5	6	27.7	3.86	22.4	31.7	12	28.4	3.07	22.4	31.7
16-18	9	29.7	2.13	26.7	32.6	3	27.1	2.00	25.8	29.4	12	29.1	2.33	25.8	32.6
18-25	10	33.1	4.53	25.4	39.7	6	28.6	2.49	26.5	33.0	16	31.4	4.40	25.4	39.7

**Left ramus height (*cd.l-go.l*)**

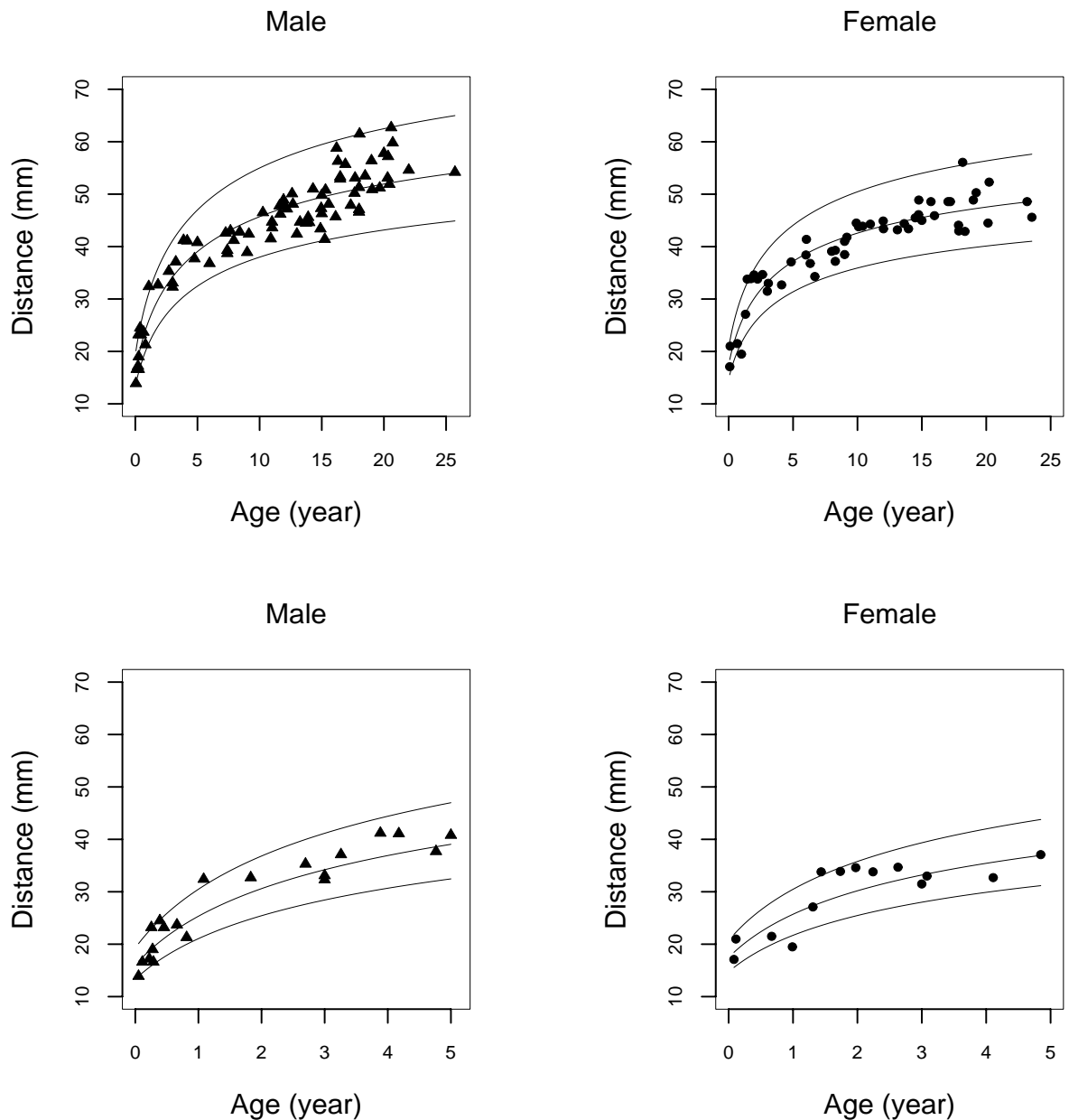


**Figure 3.87** Graphs of left ramus height (*cd.l-go.l*) versus age for males and females from birth to adulthood (above) and from birth to age five years (below).

**Table 3.87** Means (M), standard deviations (SD), minimum and maximum values (in mm) for left ramus height (*cd.l-go.l*) at different age intervals.

Age group	Males					Females					Total				
	N	M	SD	Min	Max	N	M	SD	Min	Max	N	M	SD	Min	Max
0-1	10	19.7	3.66	13.0	24.6	4	19.9	1.69	17.9	21.6	14	19.7	3.15	13.0	24.6
1-3	5	32.8	1.38	31.4	34.3	6	32.3	1.20	30.5	33.4	11	32.5	1.25	30.5	34.3
3-5	5	37.9	1.10	36.5	39.5	3	33.9	3.52	31.9	38.0	8	36.4	2.91	31.9	39.5
5-10	9	40.5	2.57	36.4	44.0	12	39.2	3.45	34.6	45.1	21	39.8	3.10	34.6	45.1
10-12	8	44.3	2.55	40.1	48.0	4	45.5	1.75	43.7	47.6	12	44.7	2.30	40.1	48.0
12-14	8	47.2	3.69	43.1	51.9	4	44.3	1.07	43.2	45.7	12	46.2	3.33	43.1	51.9
14-16	7	46.8	3.48	41.5	50.8	6	45.5	1.59	43.9	48.1	13	46.2	2.75	41.5	50.8
16-18	11	50.2	3.80	45.6	56.5	4	45.4	2.25	43.4	47.9	15	48.9	4.02	43.4	56.5
18-25	12	56.0	3.98	51.2	62.2	8	47.6	5.35	40.3	55.9	20	52.7	6.13	40.3	62.2

**Right ramus height (*cd.r-go.r*)**

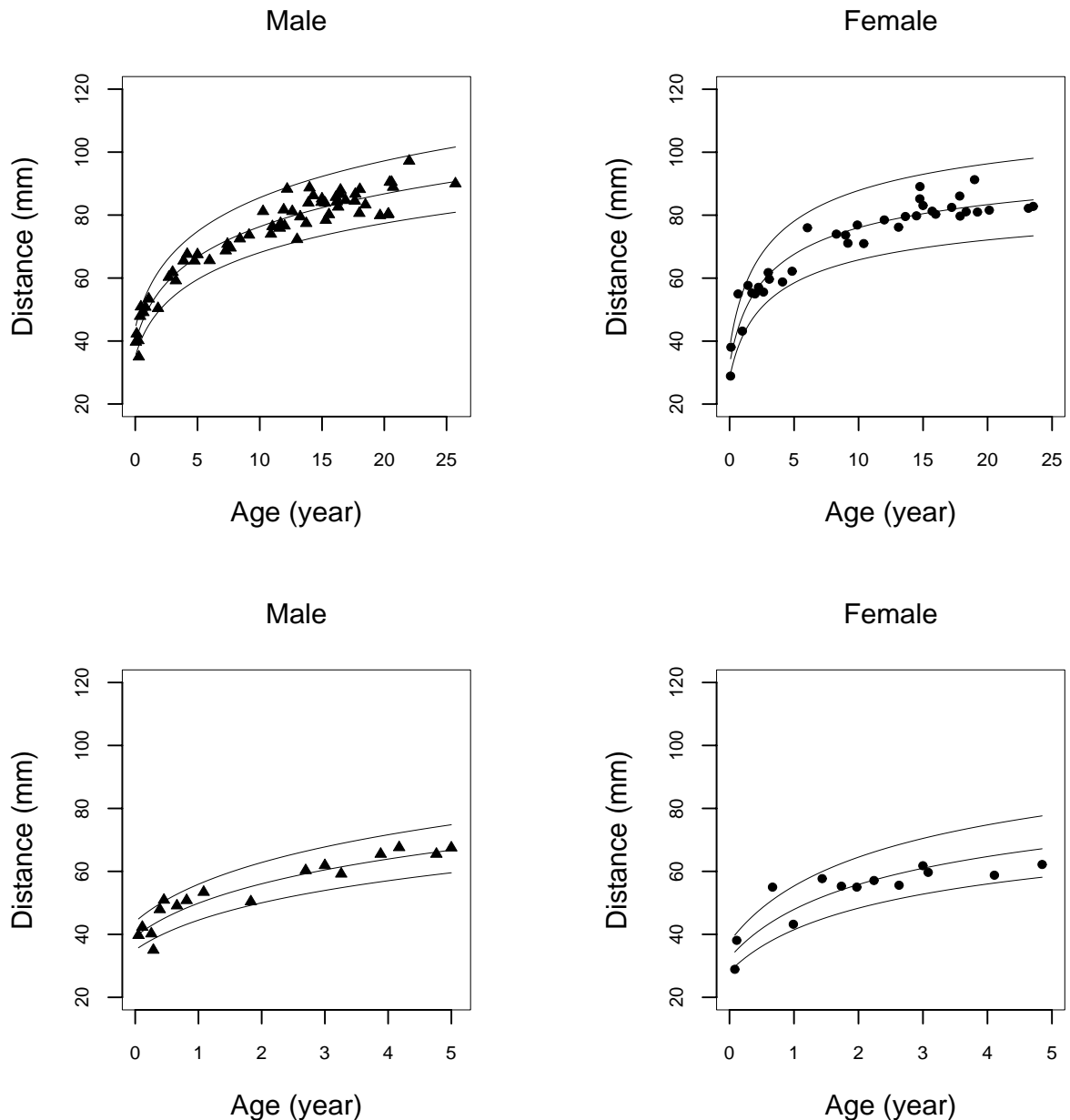


**Figure 3.88** Graphs of right ramus height (*cd.r-go.r*) versus age for males and females from birth to adulthood (above) and from birth to age five years (below).

**Table 3.88** Means (M), standard deviations (SD), minimum and maximum values (in mm) for right ramus height (*cd.r-go.r*) at different age intervals.

Age group	Males					Females					Total				
	N	M	SD	Min	Max	N	M	SD	Min	Max	N	M	SD	Min	Max
0-1	10	19.9	3.73	13.9	24.5	4	19.8	1.98	17.1	21.5	14	19.9	3.25	13.9	24.5
1-3	5	33.2	1.24	32.3	35.3	7	32.8	2.72	27.1	34.7	12	32.9	2.15	27.1	35.3
3-5	5	39.6	2.01	37.1	41.2	3	34.3	2.46	32.7	37.1	8	37.6	3.40	32.7	41.2
5-10	9	40.6	2.26	36.8	43.0	11	39.3	2.79	34.3	44.5	20	39.9	2.59	34.3	44.5
10-12	8	45.9	2.46	41.5	48.9	4	44.2	0.50	43.8	44.9	12	45.3	2.14	41.5	48.9
12-14	8	45.9	2.44	42.4	50.1	4	43.6	0.54	43.2	44.4	12	45.1	2.27	42.4	50.1
14-16	8	47.3	3.46	41.4	51.0	6	46.7	1.66	45.0	48.9	14	47.0	2.76	41.4	51.0
16-18	12	51.6	4.19	45.7	58.8	4	46.1	2.95	43.0	48.6	16	50.2	4.55	43.0	58.8
18-25	13	55.8	3.87	50.9	62.7	8	48.7	4.33	42.9	56.1	21	53.0	5.29	42.9	62.7

**Left mandibular body length (*go.l-gn*)**

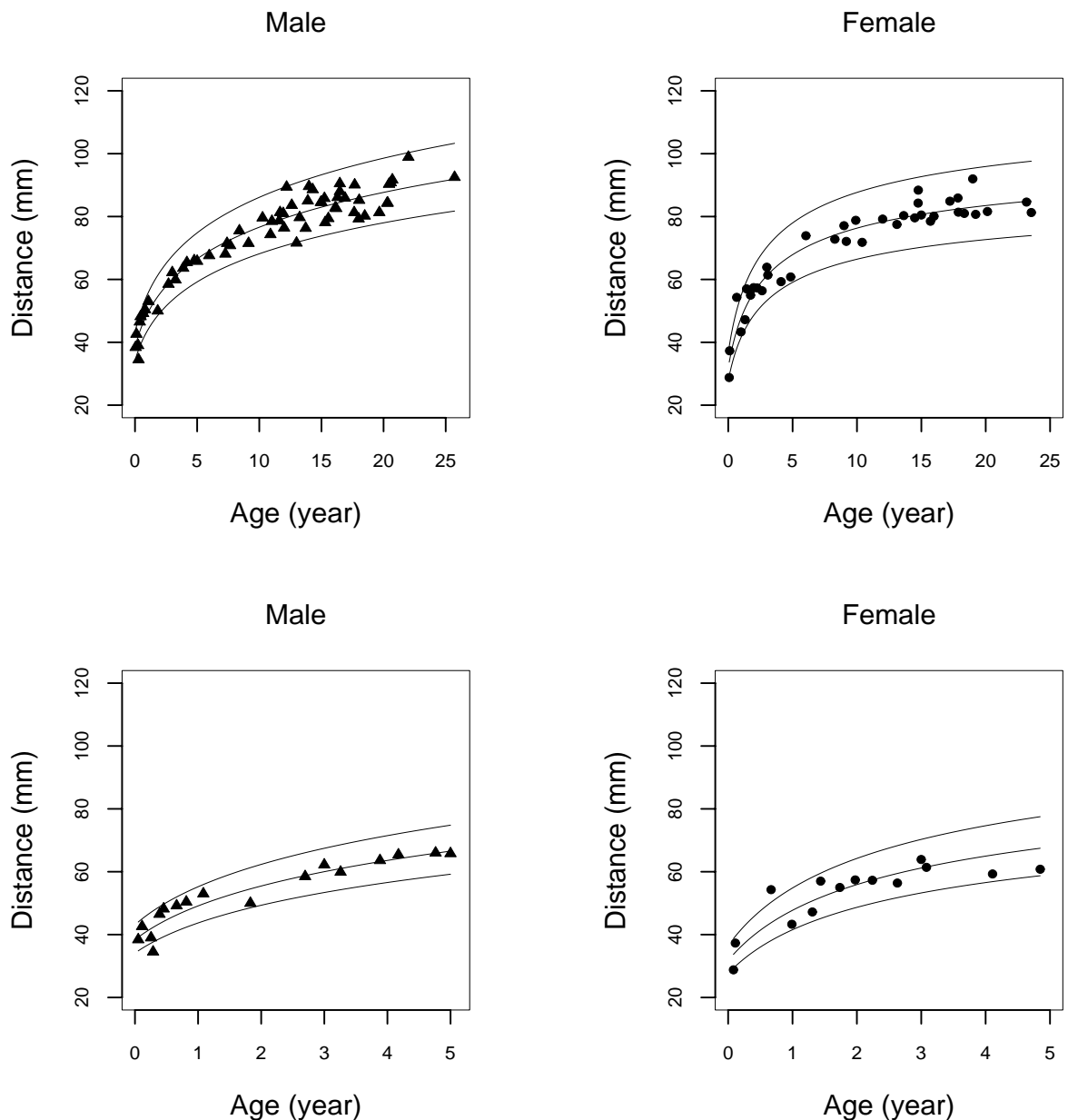


**Figure 3.89** Graphs of left mandibular body length (*go.l-gn*) versus age for males and females from birth to adulthood (above) and from birth to age five years (below).

**Table 3.89** Means (M), standard deviations (SD), minimum and maximum values (in mm) for left mandibular body length (*go.l-gn*) at different age intervals.

Age group	Males					Females					Total				
	N	M	SD	Min	Max	N	M	SD	Min	Max	N	M	SD	Min	Max
0-1	8	44.5	5.98	35.0	50.9	4	41.3	10.88	28.9	55.0	12	43.4	7.58	28.9	55.0
1-3	4	56.5	5.49	50.4	61.9	6	57.1	2.54	55.0	61.8	10	56.9	3.71	50.4	61.9
3-5	5	65.1	3.43	59.2	67.6	3	60.2	1.76	58.8	62.2	8	63.3	3.72	58.8	67.6
5-10	6	70.2	2.89	65.6	73.7	5	74.3	2.25	71.1	76.9	11	72.1	3.31	65.6	76.9
10-12	7	77.6	2.83	74.0	81.7	2	74.8	5.30	71.0	78.5	9	77.0	3.33	71.0	81.7
12-14	7	81.6	5.91	72.3	88.7	2	77.9	2.40	76.2	79.6	9	80.8	5.44	72.3	88.7
14-16	6	83.0	3.04	78.4	86.2	6	83.1	3.53	79.8	89.1	12	83.1	3.14	78.4	89.1
16-18	9	84.9	2.26	80.6	88.0	3	82.8	3.21	79.7	86.1	12	84.3	2.54	79.7	88.0
18-25	10	86.9	5.74	79.9	97.2	6	83.3	3.96	81.0	91.3	16	85.6	5.31	79.9	97.2

**Right mandibular body length (*go.r-gn*)**

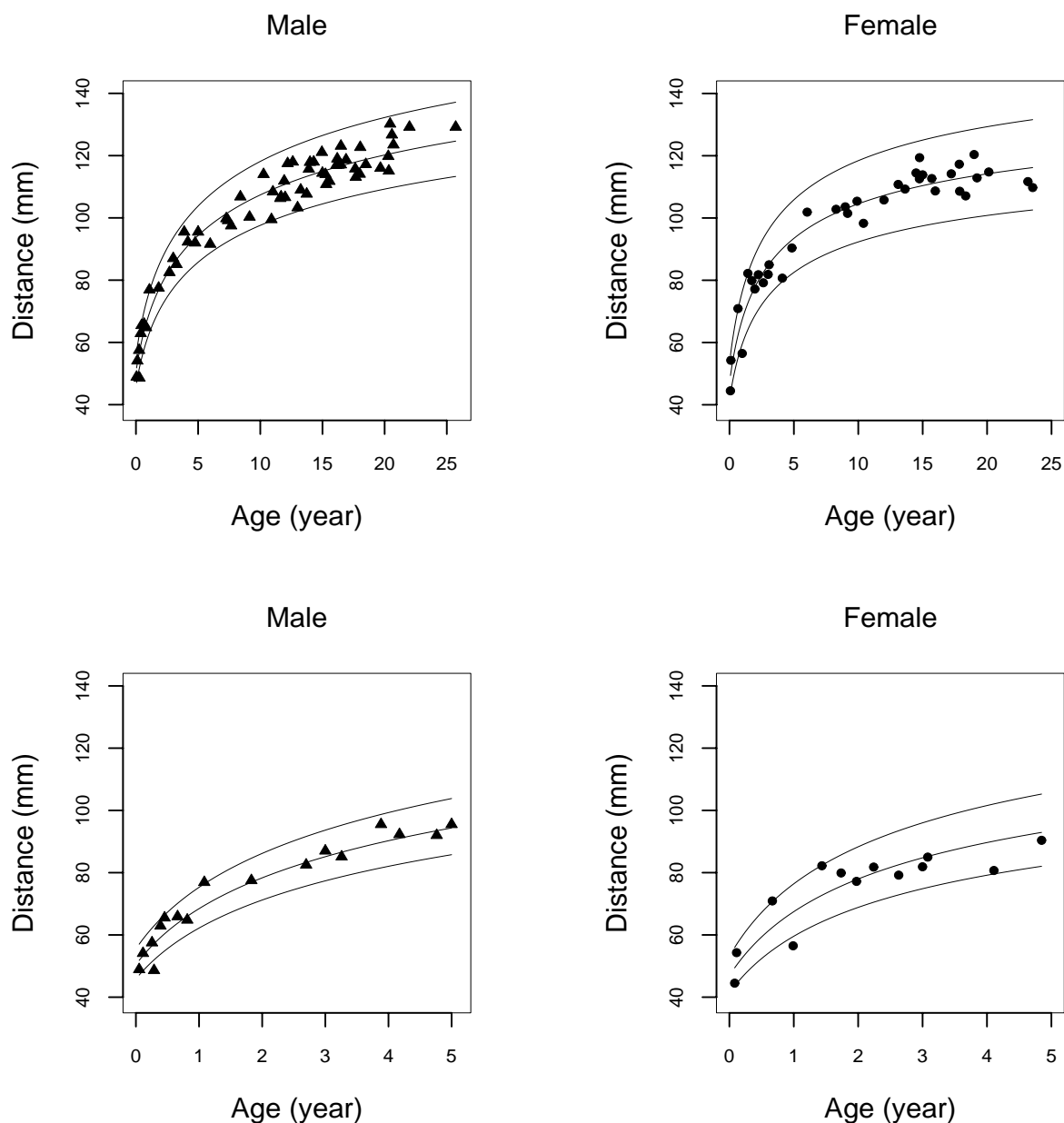


**Figure 3.90** Graphs of right mandibular body length (*go.r-gn*) versus age for males and females from birth to adulthood (above) and from birth to age five years (below).

**Table 3.90** Means (M), standard deviations (SD), minimum and maximum values (in mm) for right mandibular body length (*go.r-gn*) at different age intervals.

Age group	Males					Females					Total				
	N	M	SD	Min	Max	N	M	SD	Min	Max	N	M	SD	Min	Max
0-1	8	43.6	5.85	34.5	50.4	4	40.9	10.72	28.8	54.3	12	42.7	7.40	28.8	54.3
1-3	4	55.9	5.47	50.0	62.2	7	56.3	4.92	47.2	63.9	11	56.2	4.85	47.2	63.9
3-5	5	64.1	2.55	59.9	66.0	3	60.5	1.08	59.3	61.4	8	62.8	2.76	59.3	66.0
5-10	6	70.8	2.85	67.6	75.5	5	74.9	2.88	72.1	78.8	11	72.7	3.46	67.6	78.8
10-12	7	78.5	2.50	74.3	81.3	2	75.5	5.23	71.8	79.2	9	77.9	3.15	71.8	81.3
12-14	7	82.2	6.71	71.6	89.6	2	78.9	1.98	77.5	80.3	9	81.4	6.02	71.6	89.6
14-16	6	83.5	3.99	78.1	88.6	6	81.9	3.74	78.5	88.4	12	82.7	3.78	78.1	88.6
16-18	9	85.2	3.93	79.3	90.5	3	84.1	2.36	81.4	85.9	12	84.9	3.54	79.3	90.5
18-25	10	88.0	5.84	80.2	98.9	6	83.5	4.38	80.7	92.0	16	86.3	5.63	80.2	98.9

**Left total mandibular length (*gn-cd.l*)**

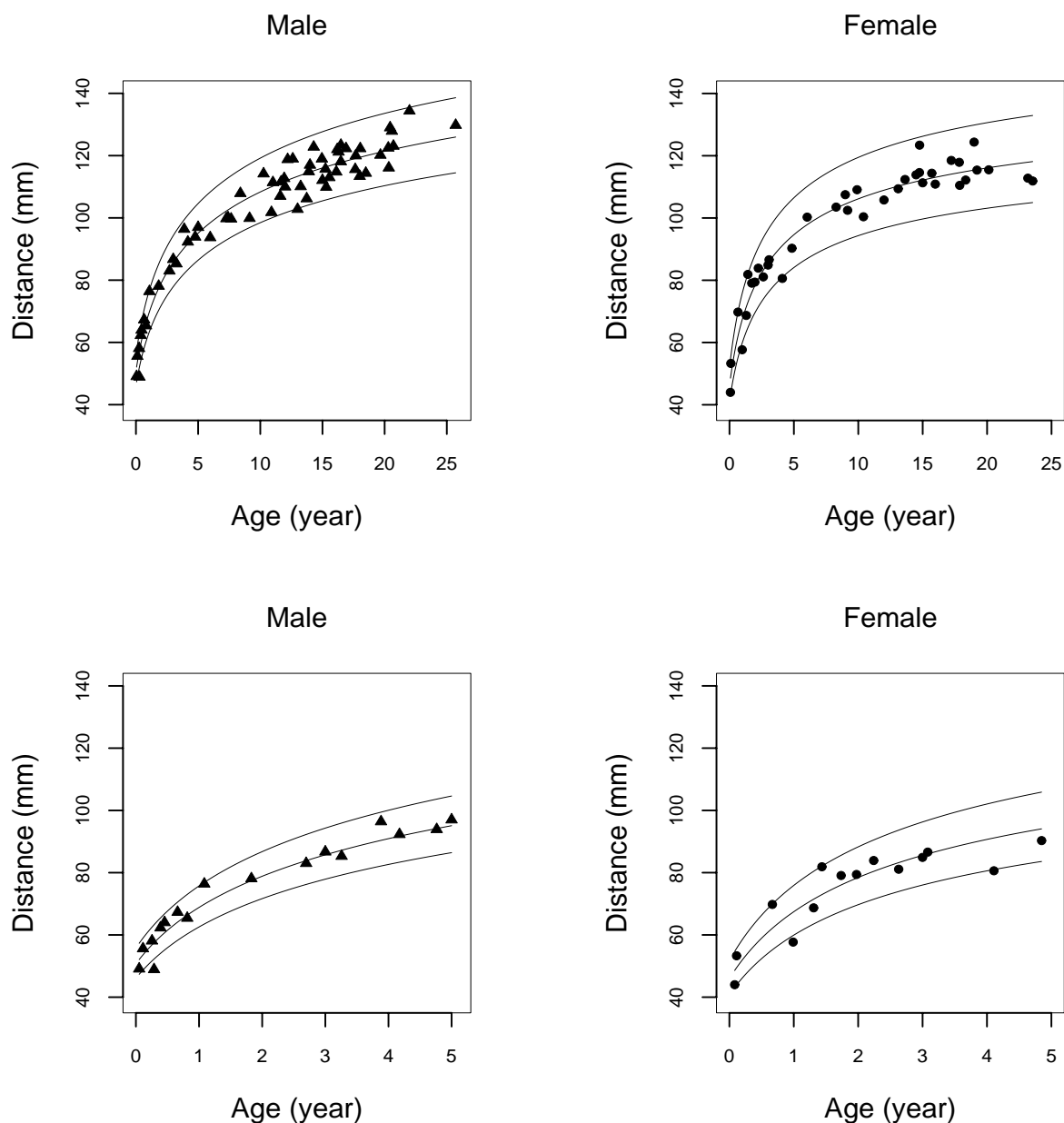


**Figure 3.91** Graphs of left total mandibular length (*gn-cd.l*) versus age for males and females from birth to adulthood (above) and from birth to age five years (below).

**Table 3.91** Means (M), standard deviations (SD), minimum and maximum values (in mm) for left total mandibular length (*gn-cd.l*) at different age intervals.

Age group	Males					Females					Total				
	N	M	SD	Min	Max	N	M	SD	Min	Max	N	M	SD	Min	Max
0-1	8	58.5	7.30	48.6	65.9	4	56.6	10.90	44.5	70.9	12	57.9	8.20	44.5	70.9
1-3	4	81.0	4.74	76.9	87.0	6	80.4	1.97	77.2	82.2	10	80.6	3.12	76.9	87.0
3-5	5	92.1	4.25	85.1	95.5	3	85.4	4.86	80.7	90.4	8	89.6	5.40	80.7	95.5
5-10	6	99.2	4.90	91.6	106.8	5	103.0	1.55	101.5	105.4	11	100.9	4.12	91.6	106.8
10-12	7	107.6	4.64	99.5	114.0	2	102.1	5.30	98.3	105.8	9	106.4	5.07	98.3	114.0
12-14	7	112.7	5.98	103.3	118.0	2	110.1	1.06	109.3	110.8	9	112.1	5.32	103.3	118.0
14-16	6	115.0	3.88	110.8	121.1	6	113.6	3.47	108.7	119.4	12	114.3	3.59	108.7	121.1
16-18	9	117.2	2.93	113.1	123.1	3	113.4	4.41	108.6	117.3	12	116.2	3.58	108.6	123.1
18-25	10	123.0	5.75	115.1	130.2	6	112.8	4.57	107.1	120.4	16	119.1	7.26	107.1	130.2

**Right total mandibular length (*gn-cd.r*)**

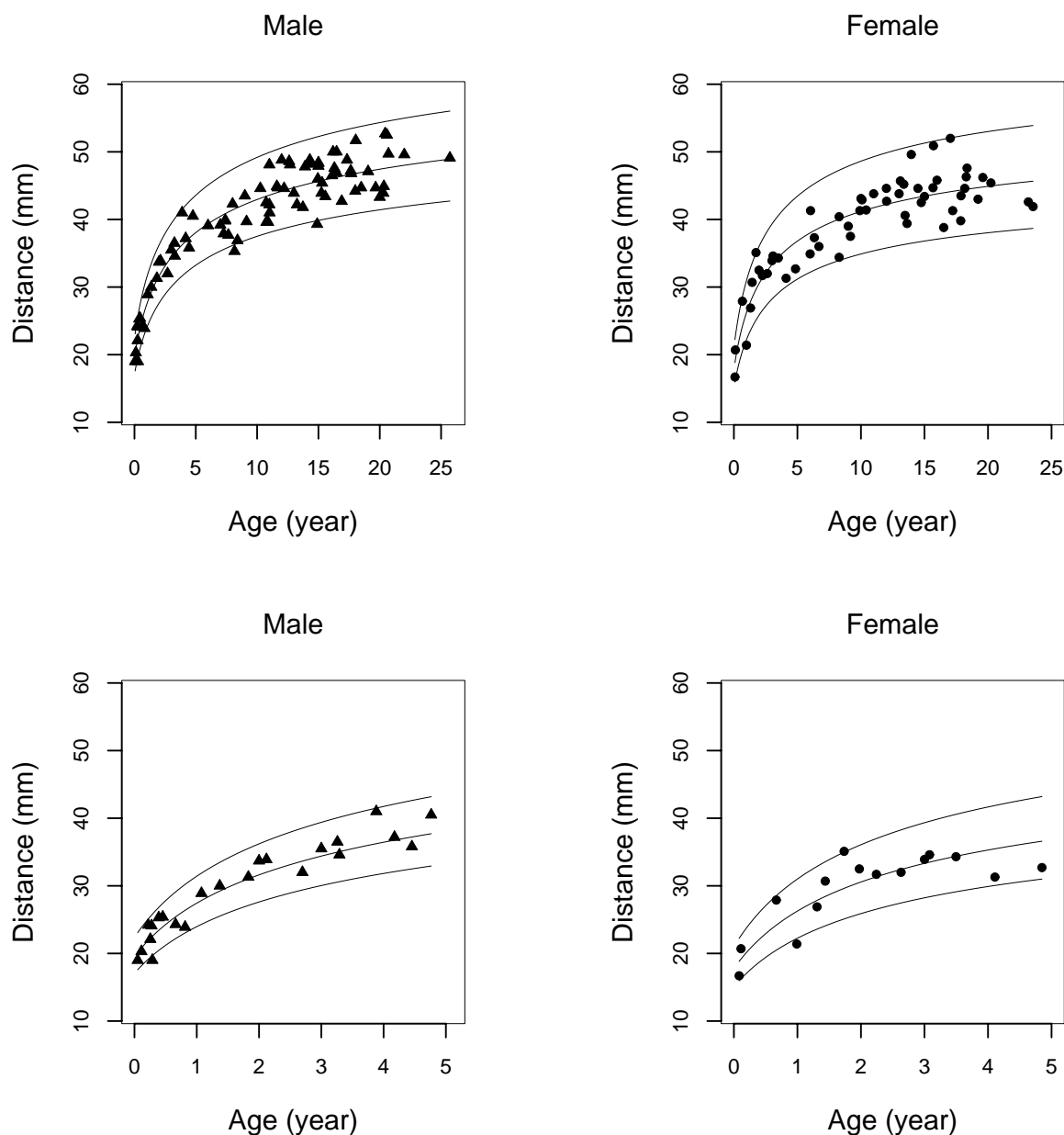


**Figure 3.92** Graphs of right total mandibular length (*gn-cd.r*) versus age for males and females from birth to adulthood (above) and from birth to age five years (below).

**Table 3.92** Means (M), standard deviations (SD), minimum and maximum values (in mm) for right total mandibular length (*gn-cd.r*) at different age intervals.

Age group	Males					Females					Total				
	N	M	SD	Min	Max	N	M	SD	Min	Max	N	M	SD	Min	Max
0-1	8	58.8	7.15	48.9	67.3	4	56.2	10.72	44.0	69.8	12	58.0	8.10	44.0	69.8
1-3	4	81.1	4.69	76.4	86.7	7	79.9	5.37	68.7	84.9	11	80.3	4.92	68.7	86.7
3-5	5	93.0	4.69	85.3	97.0	3	85.8	4.90	80.6	90.3	8	90.3	5.75	80.6	97.0
5-10	6	100.2	4.52	93.7	107.9	5	104.6	3.63	100.3	109.1	11	102.2	4.56	93.7	109.1
10-12	7	109.8	4.19	101.8	114.2	2	103.1	3.82	100.4	105.8	9	108.3	4.88	100.4	114.2
12-14	7	112.7	6.42	102.8	119.0	2	110.9	2.12	109.4	112.4	9	112.3	5.66	102.8	119.0
14-16	6	115.4	4.79	109.9	122.8	6	114.8	4.53	110.9	123.4	12	115.1	4.46	109.9	123.4
16-18	9	119.0	3.65	113.4	123.4	3	115.6	4.46	110.5	118.5	12	118.1	3.95	110.5	123.4
18-25	10	124.0	6.30	114.4	134.4	6	115.4	4.70	111.9	124.4	16	120.7	7.05	111.9	134.4

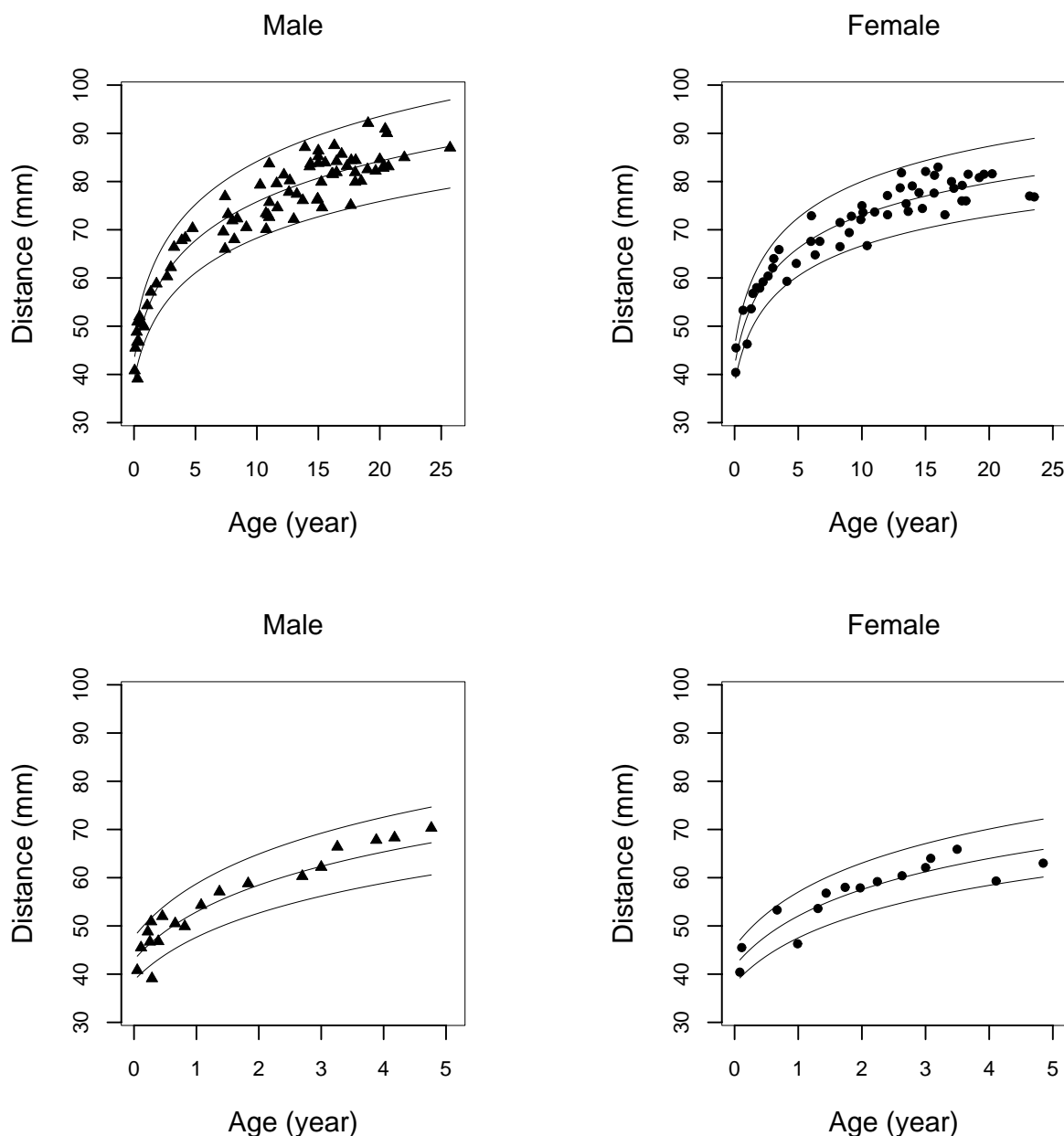


Inter-regional *s-pns* length

**Figure 3.93** Graphs of inter-regional *s-pns* length for males and females from birth to adulthood (above) and from birth to age five years (below).

**Table 3.93** Means (M), standard deviations (SD), minimum and maximum values (in mm) for inter-regional *s-pns* length at different age intervals.

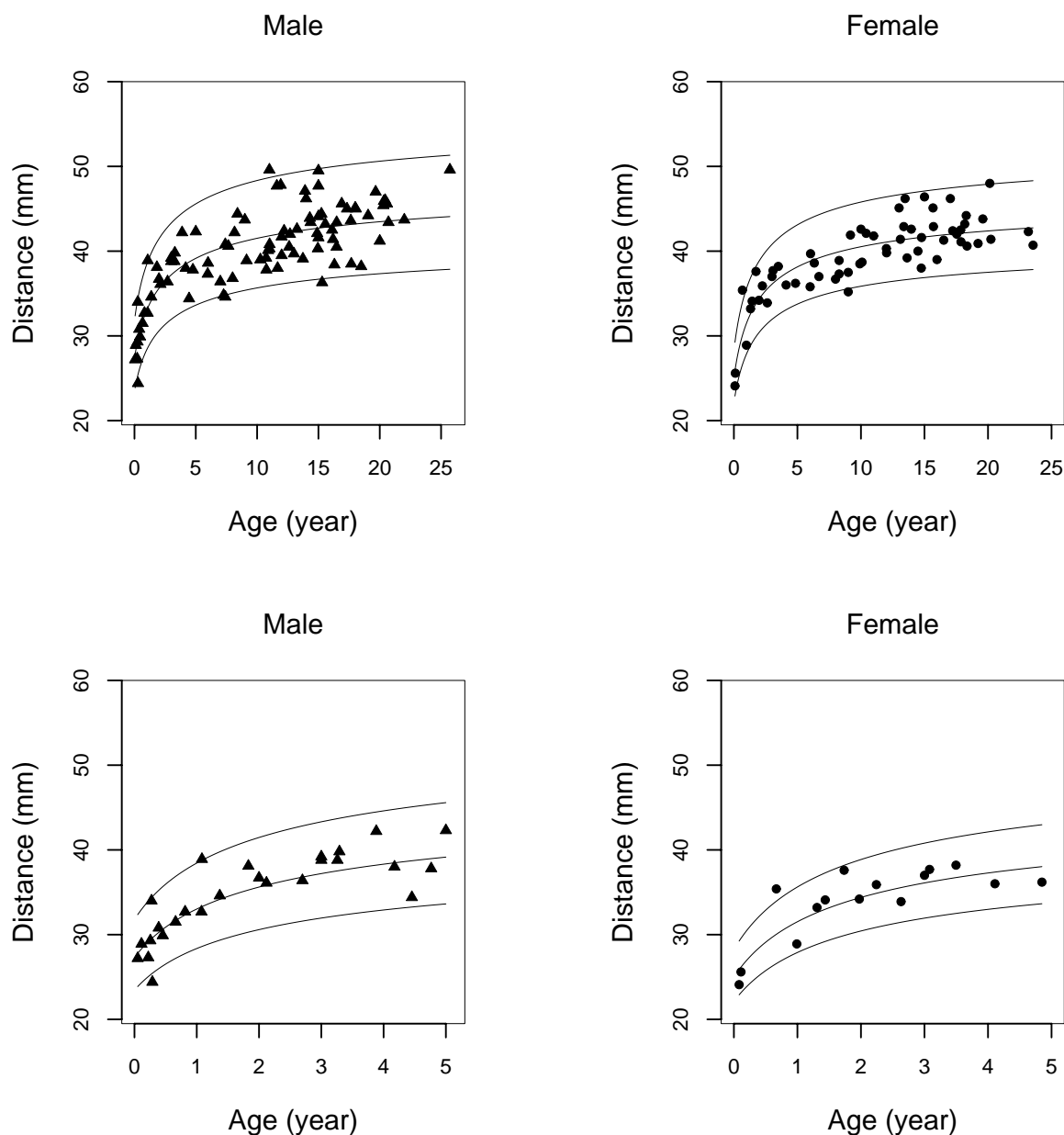
Age group	Males					Females					Total				
	N	M	SD	Min	Max	N	M	SD	Min	Max	N	M	SD	Min	Max
0-1	10	22.8	2.49	19.0	25.4	4	21.7	4.64	16.7	27.9	14	22.5	3.08	16.7	27.9
1-3	7	32.2	2.33	28.9	35.5	7	31.8	2.62	26.9	35.1	14	32.0	2.39	26.9	35.5
3-5	6	37.6	2.59	34.6	41.0	4	33.2	1.53	31.3	34.6	10	35.9	3.10	31.3	41.0
5-10	11	39.2	2.32	35.3	43.5	10	38.5	2.97	34.4	43.1	21	38.9	2.60	34.4	43.5
10-12	10	43.6	3.22	39.6	48.8	4	43.2	1.37	41.4	44.6	14	43.5	2.76	39.6	48.8
12-14	7	45.3	2.87	41.8	48.6	7	43.9	3.42	39.4	49.6	14	44.6	3.12	39.4	49.6
14-16	10	46.0	3.05	39.3	48.8	6	45.3	2.96	42.5	50.9	16	45.7	2.93	39.3	50.9
16-18	10	47.1	2.31	42.7	50.0	5	43.1	5.29	38.8	52.0	15	45.7	3.90	38.8	52.0
18-25	12	47.8	3.48	43.3	52.7	8	44.7	2.03	41.9	47.6	20	46.6	3.32	41.9	52.7

Inter-regional *s-ans* length

**Figure 3.94** Graphs of inter-regional *s-ans* length for males and females from birth to adulthood (above) and from birth to age five years (below).

**Table 3.94** Means (M), standard deviations (SD), minimum and maximum values (in mm) for inter-regional *s-ans* length at different age intervals.

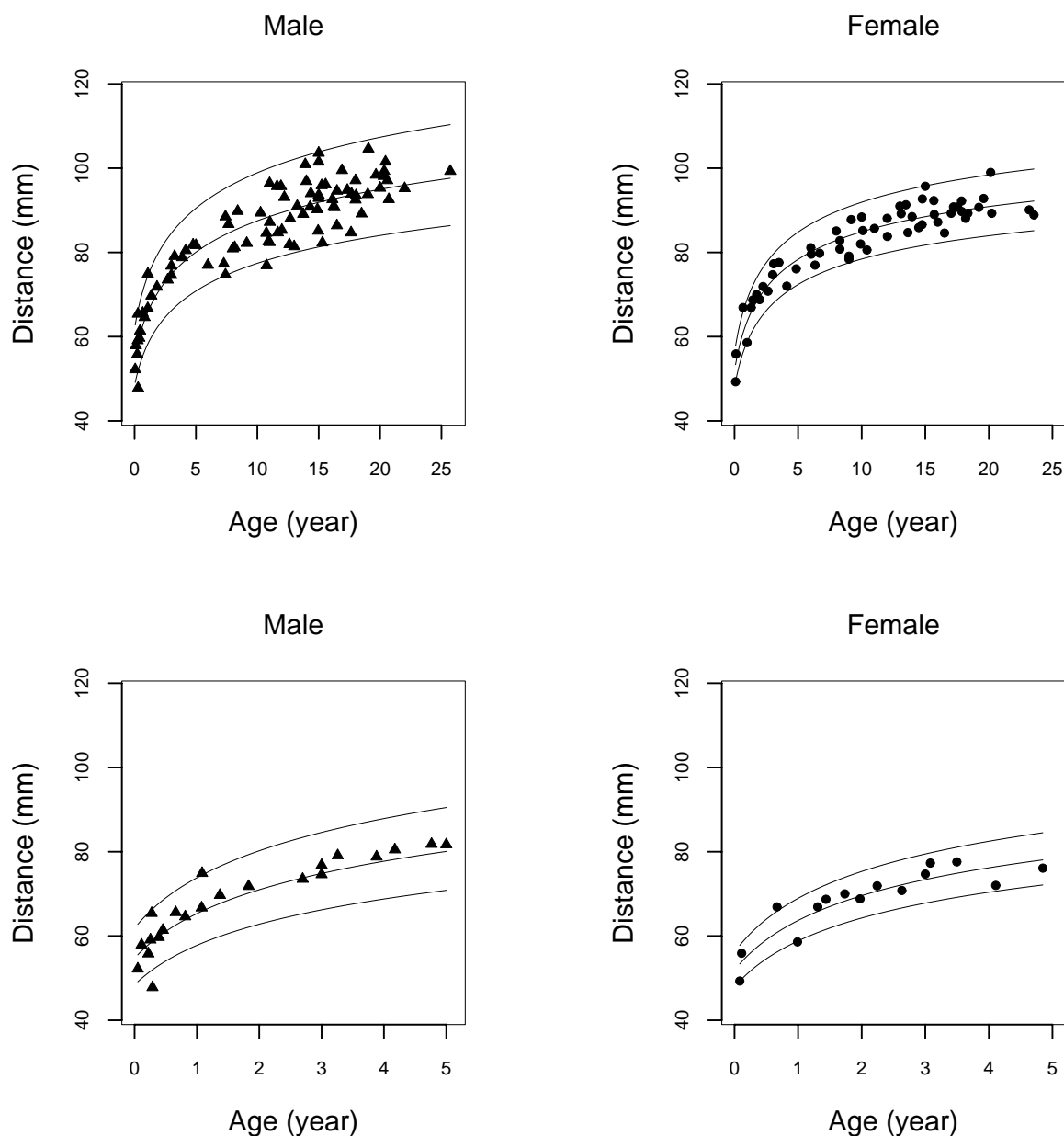
Age group	Males					Females					Total				
	N	M	SD	Min	Max	N	M	SD	Min	Max	N	M	SD	Min	Max
0-1	10	47.1	4.31	39.1	52.0	4	46.4	5.30	40.4	53.3	14	46.9	4.41	39.1	53.3
1-3	5	58.5	3.03	54.3	62.2	7	58.3	2.72	53.6	62.1	12	58.4	2.71	53.6	62.2
3-5	4	68.2	1.61	66.4	70.3	4	63.1	2.77	59.3	65.9	8	65.6	3.46	59.3	70.3
5-10	8	71.1	3.35	66.0	76.9	10	70.0	3.32	64.8	75.0	18	70.5	3.27	64.8	76.9
10-12	9	75.8	4.28	70.1	83.7	4	72.8	4.36	66.7	77.1	13	74.9	4.36	66.7	83.7
12-14	7	78.9	4.68	72.2	87.1	6	77.0	3.42	73.1	81.8	13	78.0	4.10	72.2	87.1
14-16	10	81.3	4.22	74.6	86.4	6	79.4	3.32	74.4	83.0	16	80.6	3.91	74.4	86.4
16-18	11	82.4	3.26	75.1	87.5	5	77.4	2.82	73.1	80.0	16	80.9	3.88	73.1	87.5
18-25	13	85.2	3.69	80.1	92.1	7	79.3	2.57	76.0	81.6	20	83.2	4.37	76.0	92.1

Inter-regional *ba-pns* length

**Figure 3.95** Graphs of inter-regional *ba-pns* length for males and females from birth to adulthood (above) and from birth to age five years (below).

**Table 3.95** Means (M), standard deviations (SD), minimum and maximum values (in mm) for inter-regional *ba-pns* length at different age intervals.

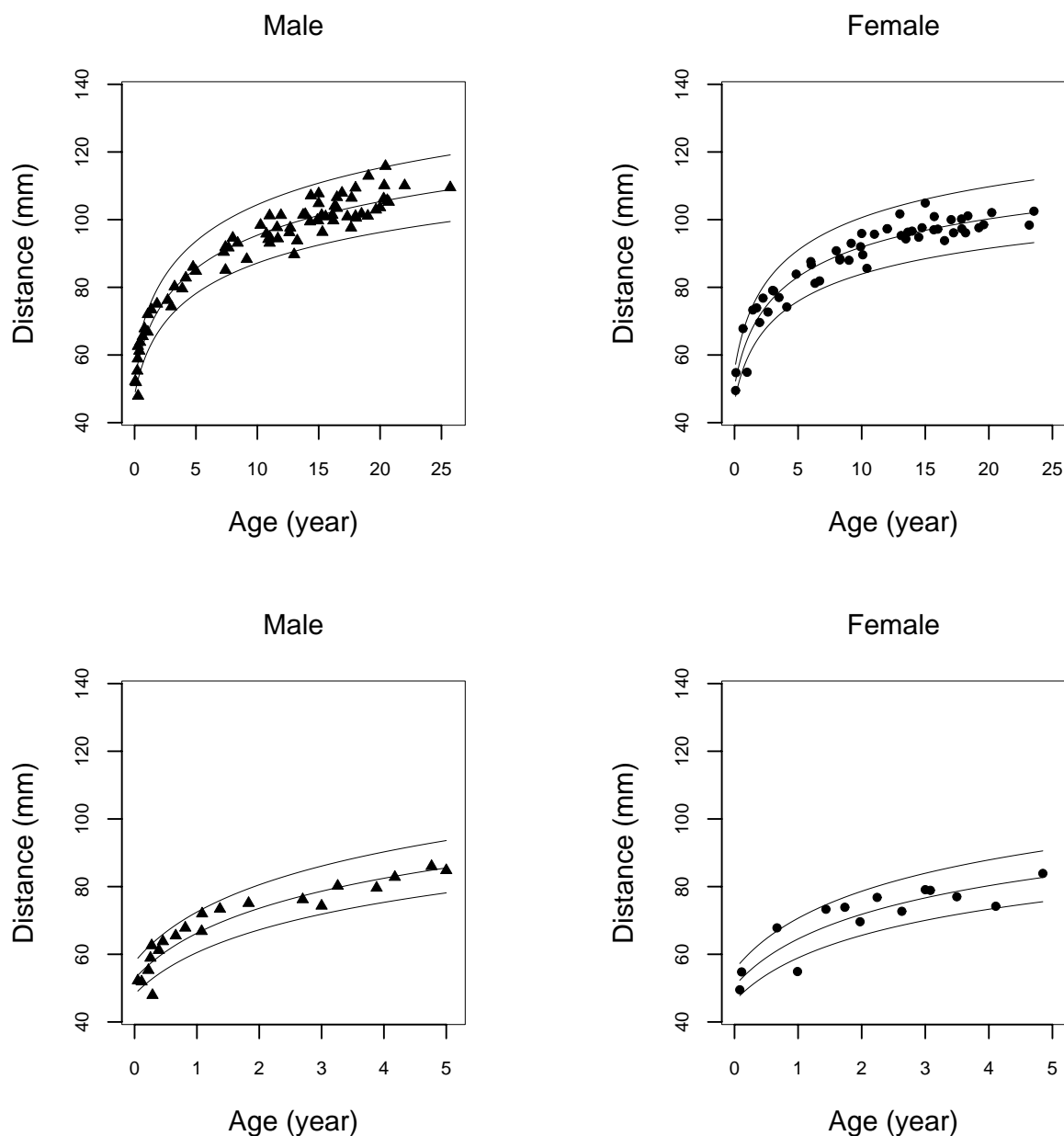
Age group	Males					Females					Total				
	N	M	SD	Min	Max	N	M	SD	Min	Max	N	M	SD	Min	Max
0-1	10	29.6	2.84	24.4	34.0	4	28.5	5.02	24.1	35.4	14	29.3	3.42	24.1	35.4
1-3	9	36.8	2.18	32.7	39.2	7	35.1	1.70	33.2	37.6	16	36.1	2.11	32.7	39.2
3-5	7	39.0	2.75	34.4	42.3	4	37.0	1.09	36.0	38.2	11	38.3	2.44	34.4	42.3
5-10	12	39.1	3.29	34.6	44.4	12	38.3	2.25	35.2	42.6	24	38.7	2.78	34.6	44.4
10-12	12	41.8	4.14	37.8	49.6	4	40.7	1.56	38.7	42.1	16	41.5	3.64	37.8	49.6
12-14	8	42.5	2.89	39.1	47.1	7	42.5	2.58	39.2	46.2	15	42.5	2.65	39.1	47.1
14-16	11	43.3	3.50	36.3	49.5	7	41.9	3.13	38.0	46.4	18	42.8	3.35	36.3	49.5
16-18	10	42.4	2.64	38.4	45.6	6	42.6	1.86	41.1	46.2	16	42.5	2.31	38.4	46.2
18-25	12	44.6	2.88	38.2	49.6	9	42.8	2.38	40.6	48.0	21	43.8	2.77	38.2	49.6

Inter-regional *ba-ans* length

**Figure 3.96** Graphs of inter-regional *ba-ans* length for males and females from birth to adulthood (above) and from birth to age five years (below).

**Table 3.96** Means (M), standard deviations (SD), minimum and maximum values (in mm) for inter-regional *ba-ans* length at different age intervals.

Age group	Males					Females					Total				
	N	M	SD	Min	Max	N	M	SD	Min	Max	N	M	SD	Min	Max
0-1	10	59.0	5.82	47.8	65.6	4	57.7	7.29	49.3	66.9	14	58.6	6.01	47.8	66.9
1-3	7	72.6	3.45	66.7	76.8	7	70.3	2.54	66.9	74.7	14	71.4	3.15	66.7	76.8
3-5	5	80.4	1.41	78.8	81.8	4	75.8	2.58	72.0	77.6	9	78.3	3.07	72.0	81.8
5-10	9	82.0	5.33	74.7	89.8	12	81.8	3.61	77.0	88.4	21	81.9	4.31	74.7	89.8
10-12	11	87.4	6.33	76.9	96.4	4	84.9	3.13	80.6	88.1	15	86.7	5.66	76.9	96.4
12-14	8	90.3	6.77	81.4	100.9	6	88.1	3.16	83.8	91.3	14	89.3	5.46	81.4	100.9
14-16	11	93.3	6.27	82.3	103.6	7	89.9	3.70	85.9	95.7	18	92.0	5.55	82.3	103.6
16-18	11	92.5	4.31	84.7	99.5	6	89.6	2.64	84.6	92.2	17	91.5	3.99	84.6	99.5
18-25	13	96.8	4.08	89.2	104.6	8	91.0	3.52	88.1	99.0	21	94.6	4.74	88.1	104.6

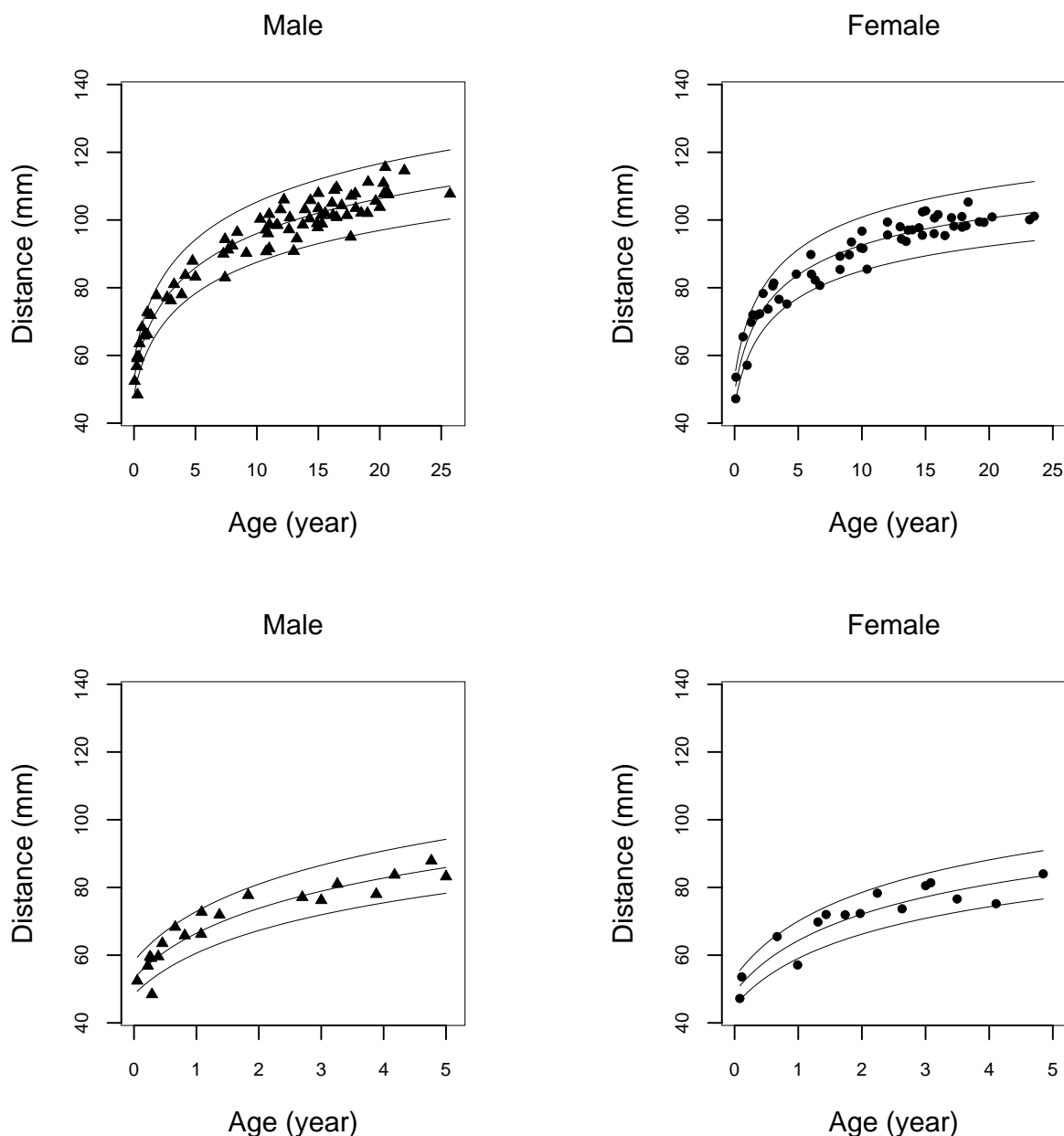
Left total face length (*au.l-ans*)

**Figure 3.97** Graphs of left total face length (*au.l-ans*) versus age for males and females from birth to adulthood (above) and from birth to age five years (below).

**Table 3.97** Means (M), standard deviations (SD), minimum and maximum values (in mm) for left total face length (*au.l-ans*) at different age intervals.

Age group	Males					Females					Total				
	N	M	SD	Min	Max	N	M	SD	Min	Max	N	M	SD	Min	Max
0-1	10	58.7	6.61	47.9	67.8	4	56.8	7.79	49.5	67.8	14	58.2	6.71	47.9	67.8
1-3	6	73.0	3.34	66.8	76.2	6	74.2	3.32	69.6	79.1	12	73.6	3.24	66.8	79.1
3-5	5	82.7	2.79	79.6	86.0	4	78.5	4.08	74.2	83.9	9	80.8	3.87	74.2	86.0
5-10	7	90.7	3.18	85.1	94.6	11	88.5	4.40	81.2	95.9	18	89.4	4.02	81.2	95.9
10-12	9	96.8	3.05	93.1	101.3	4	92.1	5.43	85.6	97.3	13	95.3	4.32	85.6	101.3
12-14	6	96.7	4.57	89.7	101.6	6	96.9	2.57	94.3	101.7	12	96.8	3.54	89.7	101.7
14-16	9	101.9	3.82	96.3	107.7	6	98.7	3.60	94.8	104.9	15	100.6	3.94	94.8	107.7
16-18	11	103.5	3.73	97.6	109.4	5	97.5	2.70	93.8	100.2	16	101.6	4.41	93.8	109.4
18-25	13	106.6	4.78	100.5	115.8	7	99.5	2.44	96.1	102.5	20	104.1	5.32	96.1	115.8

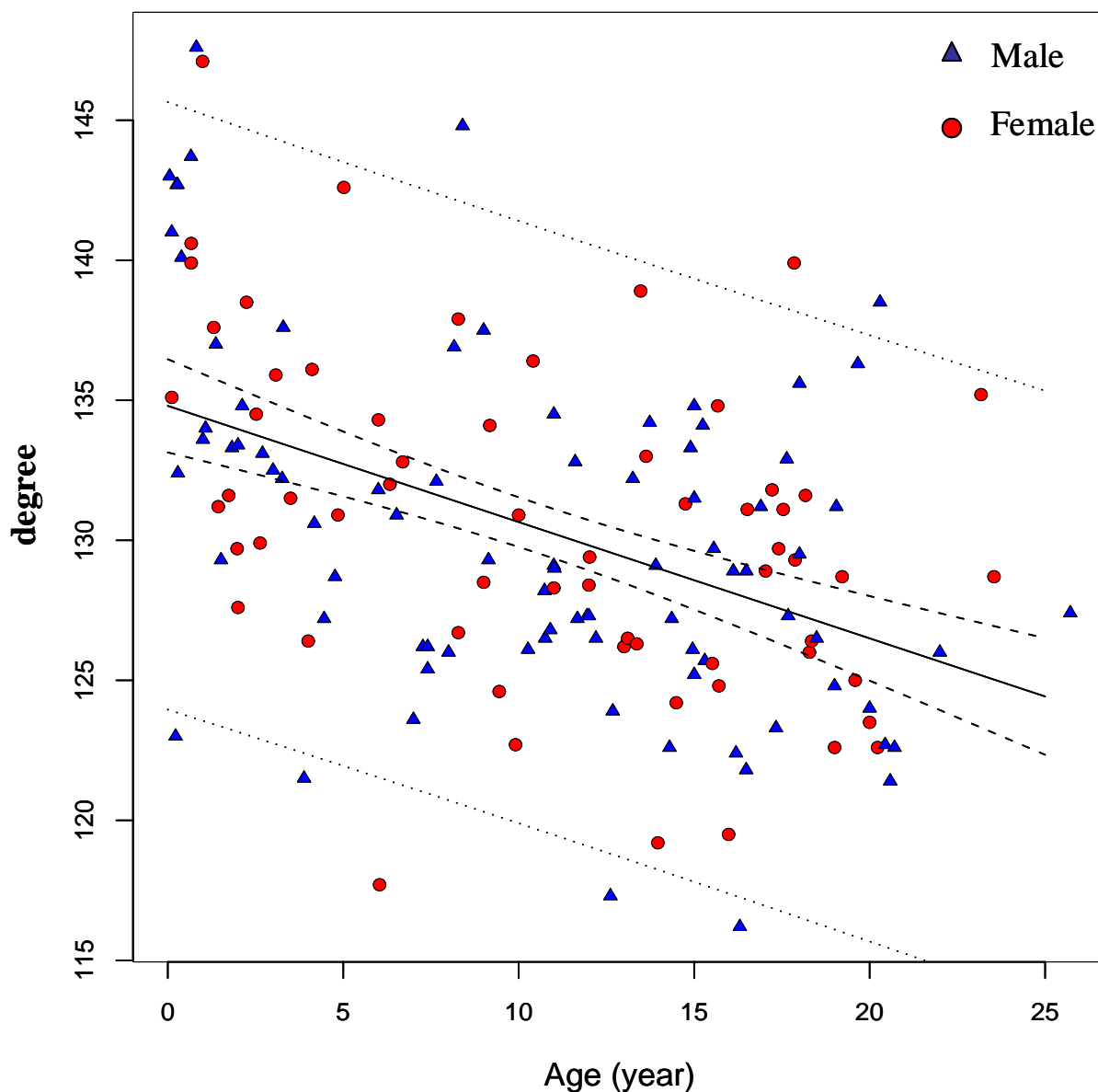
**Right total face length (*au.r-ans*)**



**Figure 3.98** Graphs of right total face length (*au.r-ans*) versus age for males and females from birth to adulthood (above) and from birth to age five years (below).

**Table 3.98** Means (M), standard deviations (SD), minimum and maximum values (in mm) for right total face length (*au.r-ans*) at different age intervals.

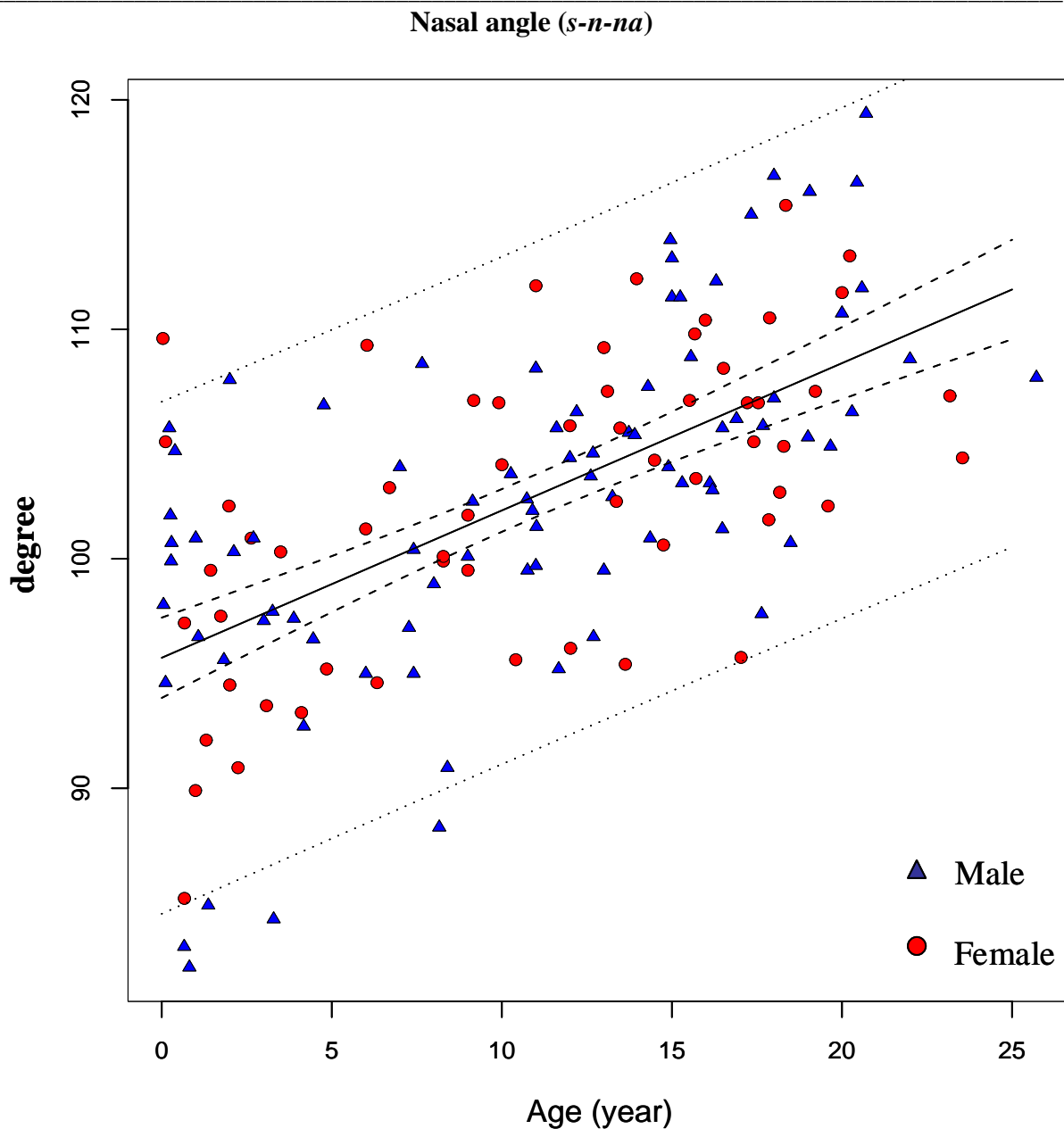
Age group	Males					Females					Total				
	N	M	SD	Min	Max	N	M	SD	Min	Max	N	M	SD	Min	Max
0-1	9	59.3	6.26	48.4	68.3	4	55.9	7.63	47.2	65.5	13	58.2	6.59	47.2	68.3
1-3	6	73.6	4.34	66.2	77.7	7	74.1	3.87	69.8	80.5	13	73.9	3.92	66.2	80.5
3-5	5	82.8	3.65	78.0	87.9	4	79.3	4.11	75.2	84.0	9	81.2	4.04	75.2	87.9
5-10	7	91.1	4.24	83.0	96.4	10	88.3	5.12	80.7	96.7	17	89.5	4.84	80.7	96.7
10-12	10	97.6	3.99	90.7	103.1	3	92.2	6.97	85.5	99.4	13	96.4	5.08	85.5	103.1
12-14	7	98.7	5.15	90.8	106.0	6	96.0	1.69	93.7	98.0	13	97.4	4.05	90.8	106.0
14-16	9	101.8	3.36	97.8	107.9	7	99.5	3.05	95.5	102.7	16	100.8	3.34	95.5	107.9
16-18	10	104.1	4.52	95.0	109.6	5	98.6	2.29	95.4	101.0	15	102.3	4.67	95.0	109.6
18-25	13	107.8	4.42	102.0	115.6	7	100.6	2.27	98.3	105.3	20	105.3	5.11	98.3	115.6

Cranial base angle (*ba-s-n*)

**Figure 3.99** Graph of cranial base angle (*ba-s-n*) versus age for males and females combined from birth to adulthood.

**Table 3.99** Means (M), standard deviations (SD), minimum and maximum values (in degree) for cranial base angle (*ba-s-n*) at different age intervals.

Age group	Males					Females					Total				
	N	M	SD	Min	Max	N	M	SD	Min	Max	N	M	SD	Min	Max
0-5	24	134.8	6.59	121.5	147.6	17	134.4	5.33	126.4	147.1	41	134.6	6.03	121.5	147.6
5-10	12	130.9	6.25	123.6	144.8	12	130.4	6.84	117.7	142.6	24	130.6	6.41	117.7	144.8
10-15	25	128.2	4.07	117.3	134.8	12	129.0	5.36	119.2	138.9	37	128.5	4.47	117.3	138.9
15-20	19	127.9	5.17	116.2	136.3	18	128.4	4.80	119.5	139.9	37	128.1	4.93	116.2	139.9
20-25	6	126.4	6.34	121.4	138.5	3	128.8	6.30	122.6	135.2	9	127.2	6.04	121.4	138.5

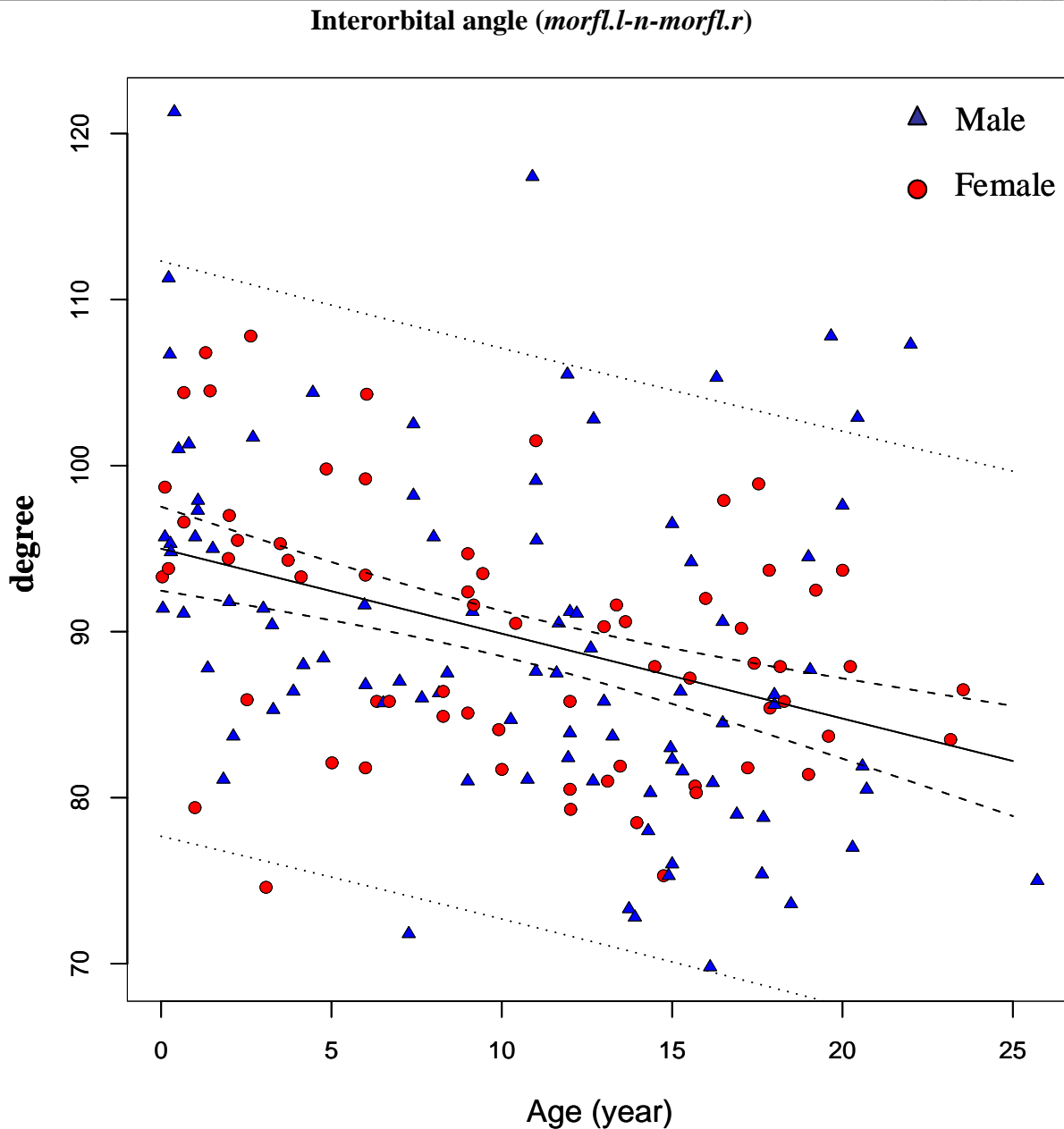


**Figure 3.100** Graph of nasal angle (*s-n-na*) versus age for males and females combined from birth to adulthood.

**Table 3.100** Means (M), standard deviations (SD), minimum and maximum values (in degree) for nasal angle (*s-n-na*) at different age intervals.

Age group	Males					Females					Total				
	N	M	SD	Min	Max	N	M	SD	Min	Max	N	M	SD	Min	Max
0-5	23	97.0	7.33	82.2	107.8	16	96.7	6.16	85.2	109.6	39	96.9	6.79	82.2	109.6
5-10	11	98.2	5.83	88.3	108.5	11	102.5	4.16	94.6	109.3	22	100.4	5.40	88.3	109.3
10-15	24	104.1	4.64	95.2	113.9	12	103.9	5.99	95.4	112.2	36	104.0	5.04	95.2	113.9
15-20	19	107.1	5.36	97.6	116.7	17	106.5	4.58	95.7	115.4	36	106.8	4.94	95.7	116.7
20-25	6	111.8	5.16	106.4	119.4	3	108.2	4.51	104.4	113.2	9	110.6	4.98	104.4	119.4

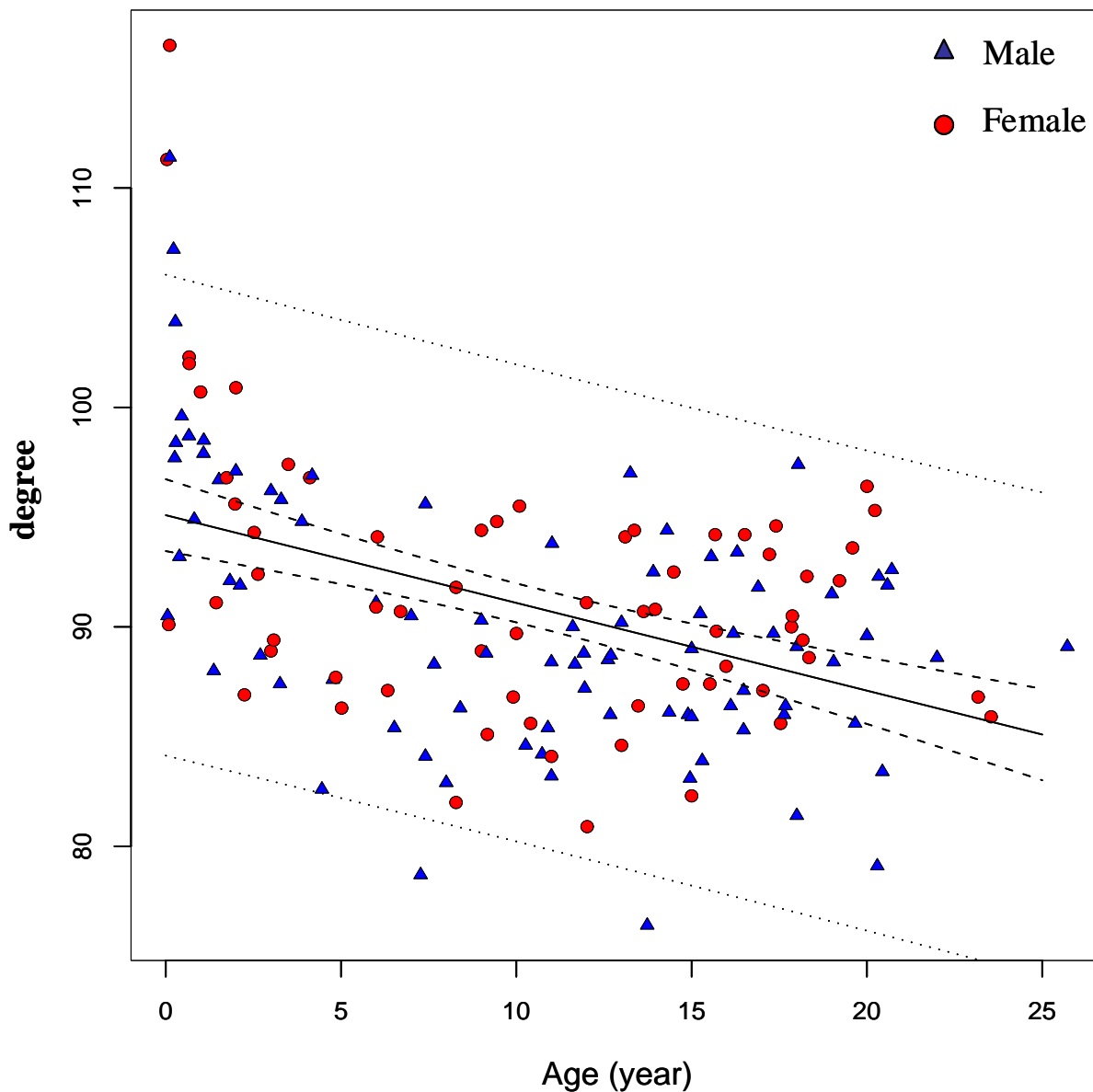




**Figure 3.101** Graph of interorbital angle (*morfl.l-n-morfl.r*) versus age for males and females combined from birth to adulthood.

**Table 3.101** Means (M), standard deviations (SD), minimum and maximum values (in degree) for interorbital angle (*morfl.l-n-morfl.r*) at different age intervals.

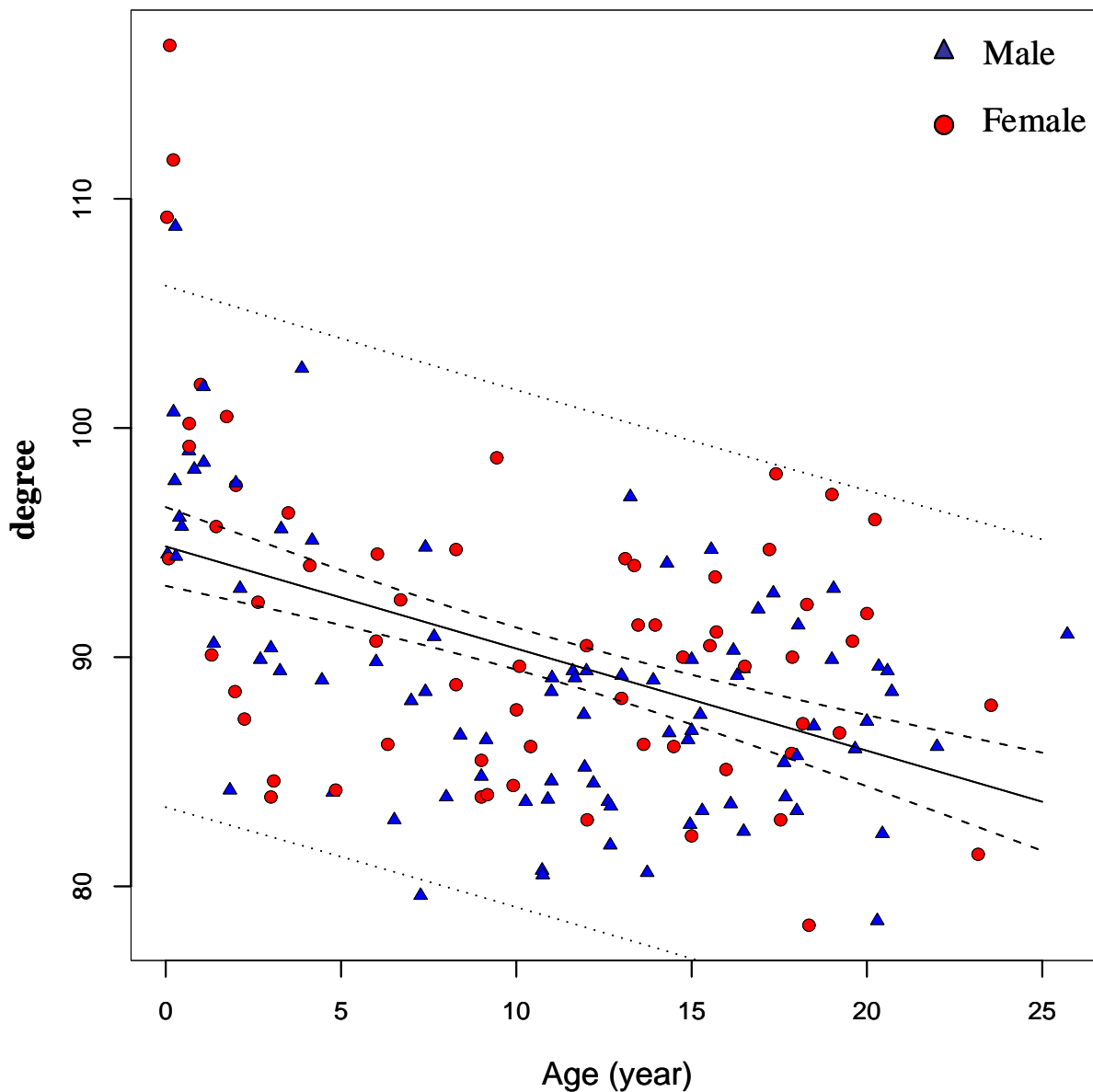
Age group	Males					Females					Total				
	N	M	SD	Min	Max	N	M	SD	Min	Max	N	M	SD	Min	Max
0-5	26	95.2	8.99	81.1	121.3	18	95.3	8.66	74.6	107.8	44	95.3	8.76	74.6	121.3
5-10	13	88.6	7.74	71.8	102.5	16	89.2	6.65	81.7	104.3	29	88.9	7.04	71.8	104.3
10-15	27	87.3	10.39	72.8	117.4	13	85.7	7.20	75.3	101.5	40	86.8	9.40	72.8	117.4
15-20	18	86.6	10.34	69.8	107.8	17	88.3	5.85	80.3	98.9	35	87.4	8.38	69.8	107.8
20-25	6	87.4	13.97	75.0	107.3	3	86.0	2.25	83.5	87.9	9	86.9	11.13	75.0	107.3

Left zygoma projection angle (*petsa.l-au.l-zt.l*)

**Figure 3.102** Graph of left zygoma projection angle (*petsa.l-au.l-zt.l*) versus age for males and females combined from birth to adulthood.

**Table 3.102** Means (M), standard deviations (SD), minimum and maximum values (in degree) for left zygoma projection angle (*petsa.l-au.l-zt.l*) at different age intervals.

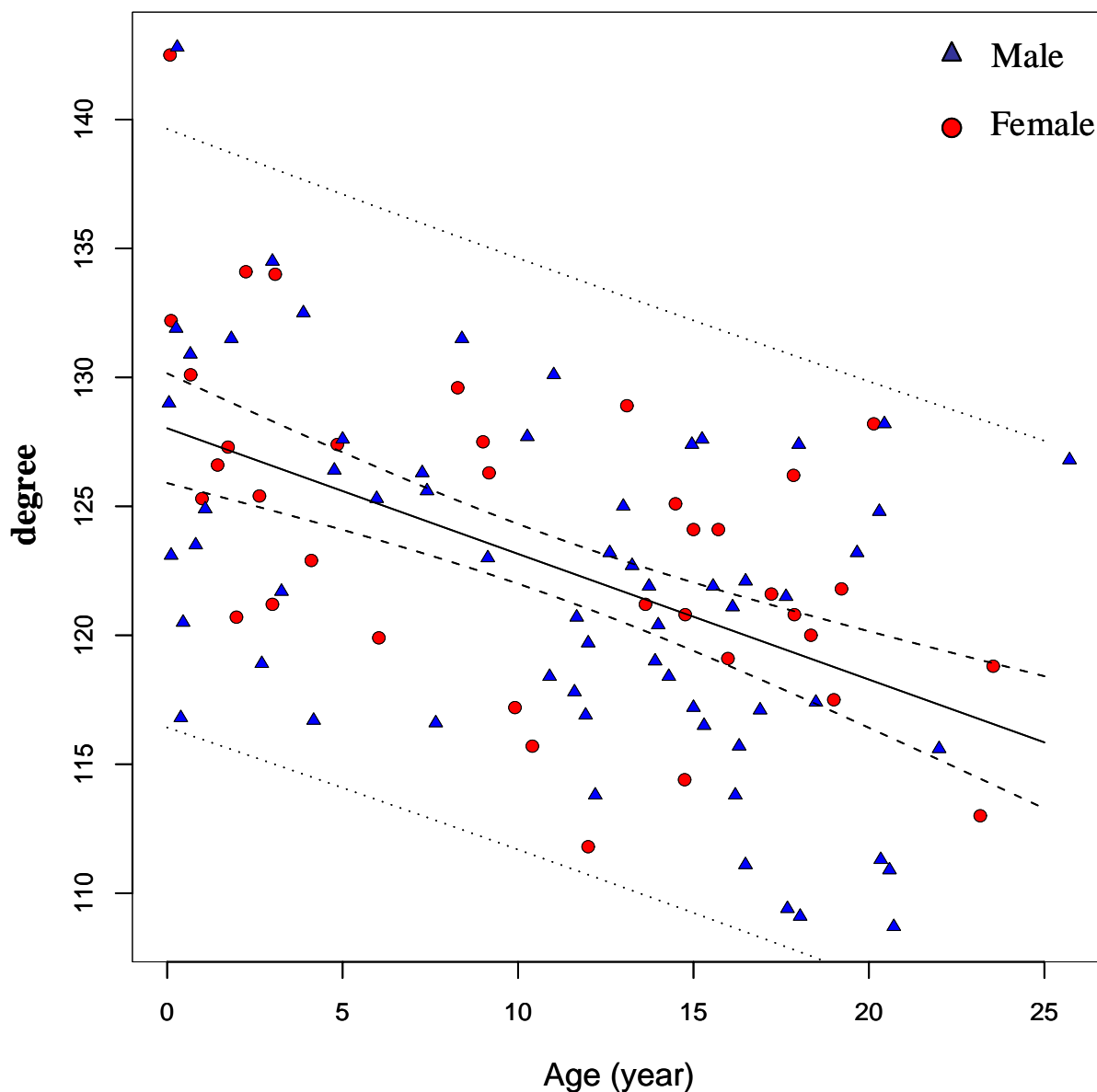
Age group	Males					Females					Total				
	N	M	SD	Min	Max	N	M	SD	Min	Max	N	M	SD	Min	Max
0-5	24	94.8	5.56	82.6	107.2	16	94.6	5.25	86.9	102.3	40	94.7	5.37	82.6	107.2
5-10	11	87.5	4.62	78.7	95.6	13	89.4	3.89	82.0	94.8	24	88.5	4.26	78.7	95.6
10-15	23	87.7	4.35	76.4	97.0	14	88.6	4.75	80.9	95.5	37	88.1	4.46	76.4	97.0
15-20	19	88.8	3.80	81.4	97.4	17	91.0	3.10	85.6	96.4	36	89.8	3.62	81.4	97.4
20-25	7	88.1	5.11	79.1	92.6	3	89.3	5.19	85.9	95.3	10	88.5	4.87	79.1	95.3

Right zygoma projection angle (*petsa.r-au.r.zt.r*)

**Figure 3.103** Graph of right zygoma projection angle (*petsa.r-au.r-zt.r*) versus age for males and females combined from birth to adulthood.

**Table 3.103** Means (M), standard deviations (SD), minimum and maximum values (in degree) for right zygoma projection angle (*petsa.r-au.r-zt.r*) at different age intervals.

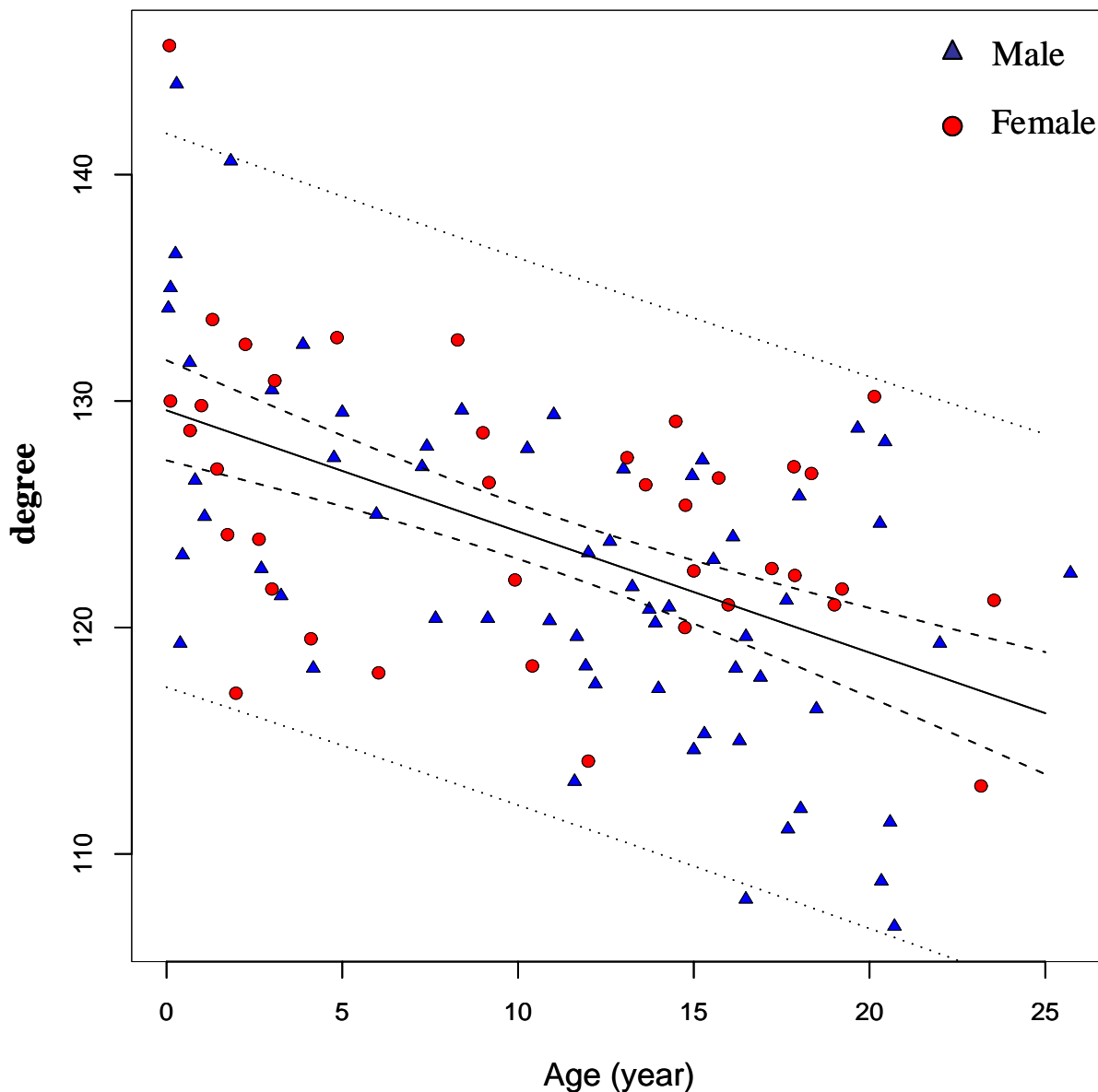
Age group	Males					Females					Total				
	N	M	SD	Min	Max	N	M	SD	Min	Max	N	M	SD	Min	Max
0-5	23	95.1	5.86	84.1	108.8	17	94.1	7.07	83.9	109.2	40	94.7	6.34	83.9	109.2
5-10	11	86.9	4.17	79.6	94.8	12	89.3	4.91	83.9	98.7	23	88.2	4.63	79.6	98.7
10-15	26	86.4	4.05	80.5	97.0	13	88.7	3.83	82.2	94.3	39	87.2	4.07	80.5	97.0
15-20	20	87.9	3.72	82.4	94.7	17	89.7	5.04	78.3	98.0	37	88.7	4.41	78.3	98.0
20-25	7	86.5	4.55	78.5	91.0	3	88.4	7.31	81.4	96.0	10	87.1	5.15	78.5	96.0

Left gonial angle (*cd.l-go.l.gn*)

**Figure 3.104** Graph of left gonial angle (*cd.l-go.l.gn*) versus age for males and females combined from birth to adulthood.

**Table 3.104** Means (M), standard deviations (SD), minimum and maximum values (in degree) for left gonial angle (*cd.l-go.l.gn*) at different age intervals.

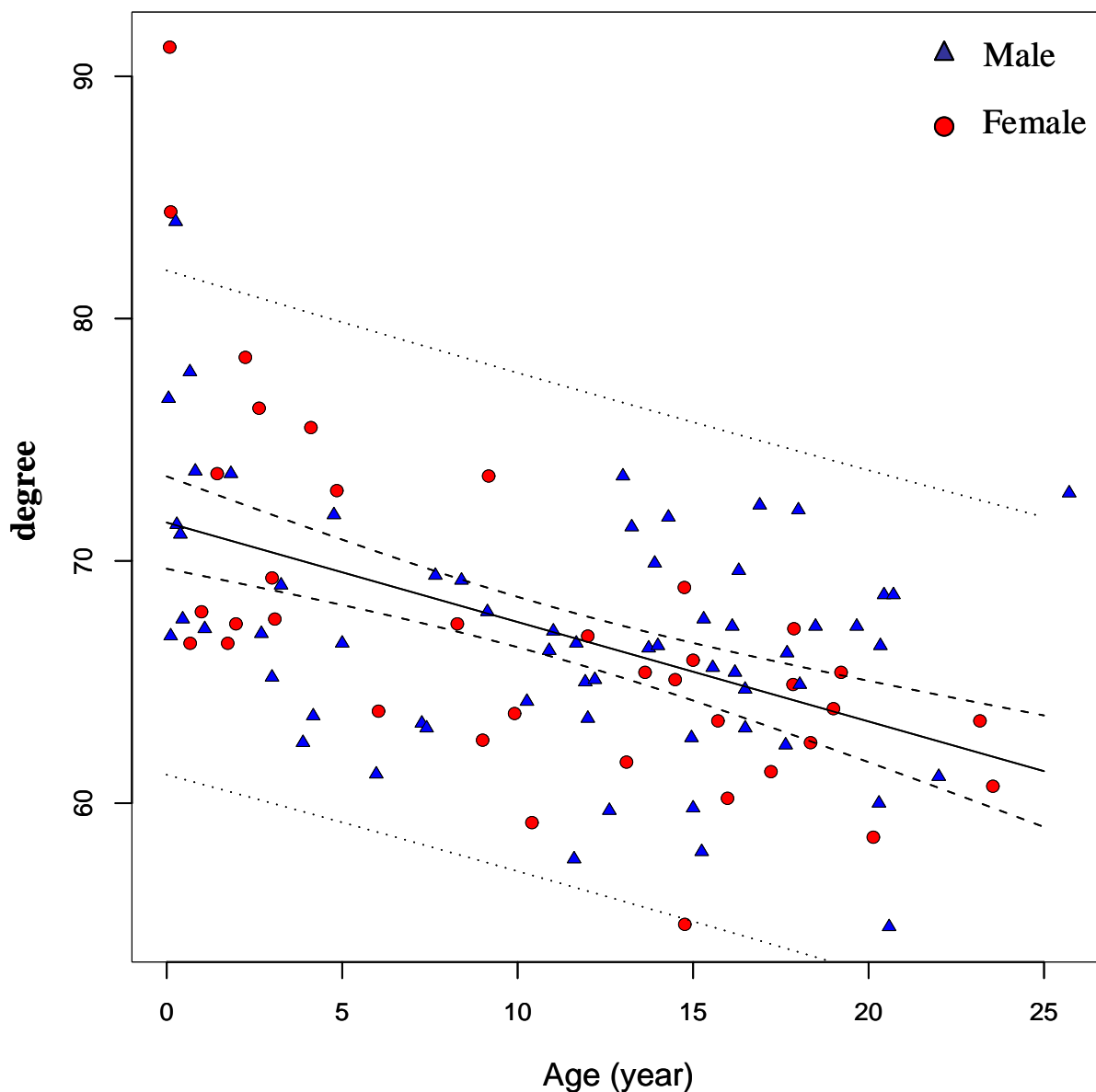
Age group	Males					Females					Total				
	N	M	SD	Min	Max	N	M	SD	Min	Max	N	M	SD	Min	Max
0-5	17	126.7	6.97	116.7	142.8	13	128.4	6.09	120.7	142.5	30	127.4	6.55	116.7	142.8
5-10	6	124.7	4.87	116.6	131.5	5	124.1	5.29	117.2	129.6	11	124.4	4.81	116.6	131.5
10-15	17	121.2	4.37	113.8	130.1	8	120.3	5.86	111.8	128.9	25	120.9	4.79	111.8	130.1
15-20	15	118.3	5.90	109.1	127.6	8	121.4	2.76	117.5	126.2	23	119.4	5.18	109.1	127.6
20-25	7	118.0	8.32	108.7	128.2	3	120.0	7.67	113.0	128.2	10	118.6	7.75	108.7	128.2

Right gonial angle (*cd.r-go.r.gn*)

**Figure 3.105** Graph of right gonial angle (*cd.r-go.r.gn*) versus age for males and females combined from birth to adulthood.

**Table 3.105** Means (M), standard deviations (SD), minimum and maximum values (in degree) for right gonial angle (*cd.r-go.r.gn*) at different age intervals.

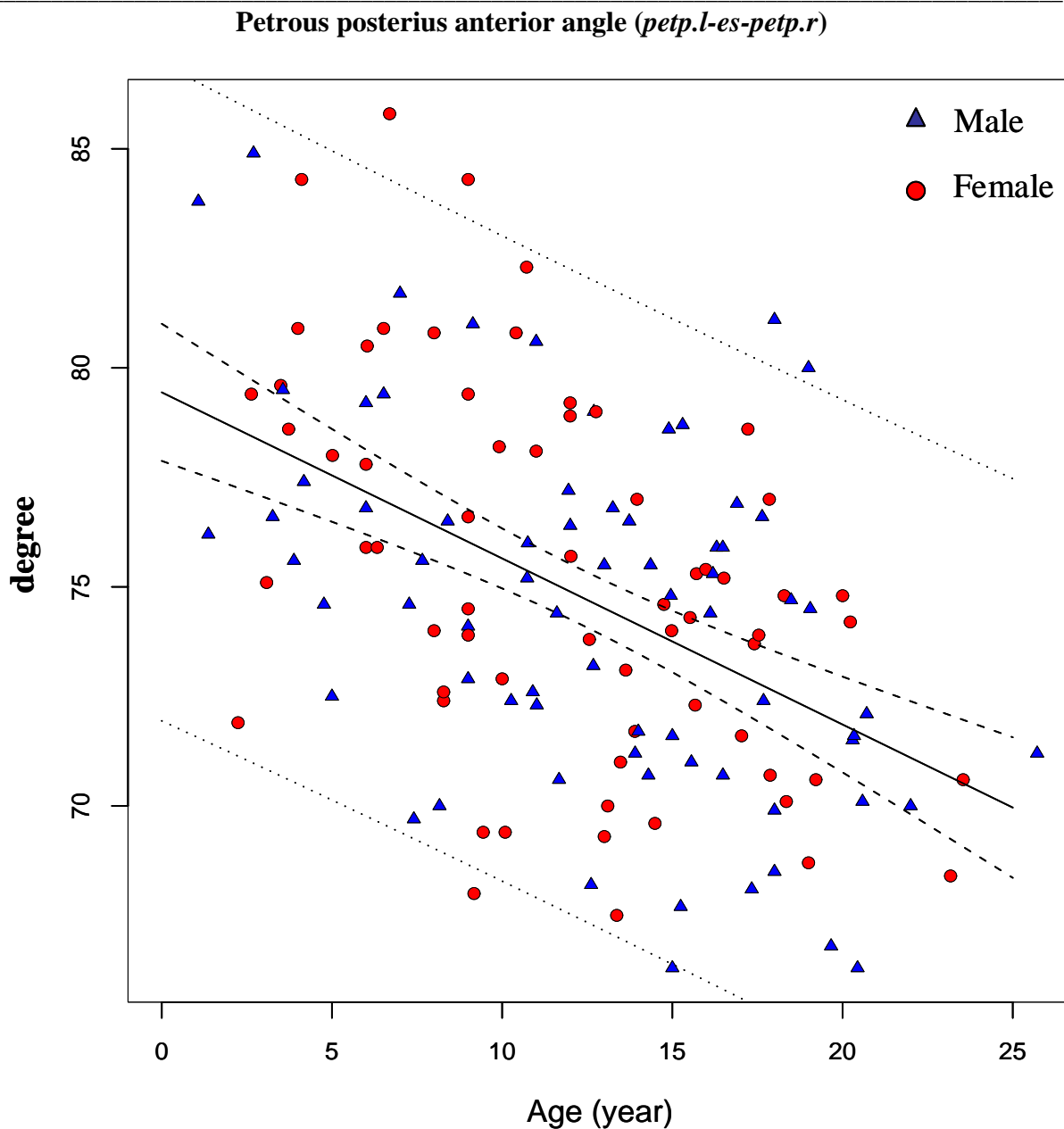
Age group	Males					Females					Total				
	N	M	SD	Min	Max	N	M	SD	Min	Max	N	M	SD	Min	Max
0-5	17	129.3	7.36	118.2	144.0	14	128.4	7.16	117.1	145.7	31	128.9	7.16	117.1	145.7
5-10	6	125.1	3.92	120.4	129.6	5	125.6	5.70	118.0	132.7	11	125.3	4.56	118.0	132.7
10-15	17	121.3	4.59	113.2	129.4	8	122.9	5.14	114.1	129.1	25	121.8	4.72	113.2	129.4
15-20	15	118.9	6.15	108.0	128.8	8	123.6	2.71	121.0	127.1	23	120.6	5.63	108.0	128.8
20-25	7	117.4	8.36	106.8	128.2	3	121.5	8.60	113.0	130.2	10	118.6	8.18	106.8	130.2

Anterior mandibular angle (*go.l-gn.go.r*)

**Figure 3.106** Graph of anterior mandibular angle (*go.l-gn.go.r*) versus age for males and females combined from birth to adulthood.

**Table 3.106** Means (M), standard deviations (SD), minimum and maximum values (in degree) for anterior mandibular angle (*go.l-gn.go.r*) at different age intervals.

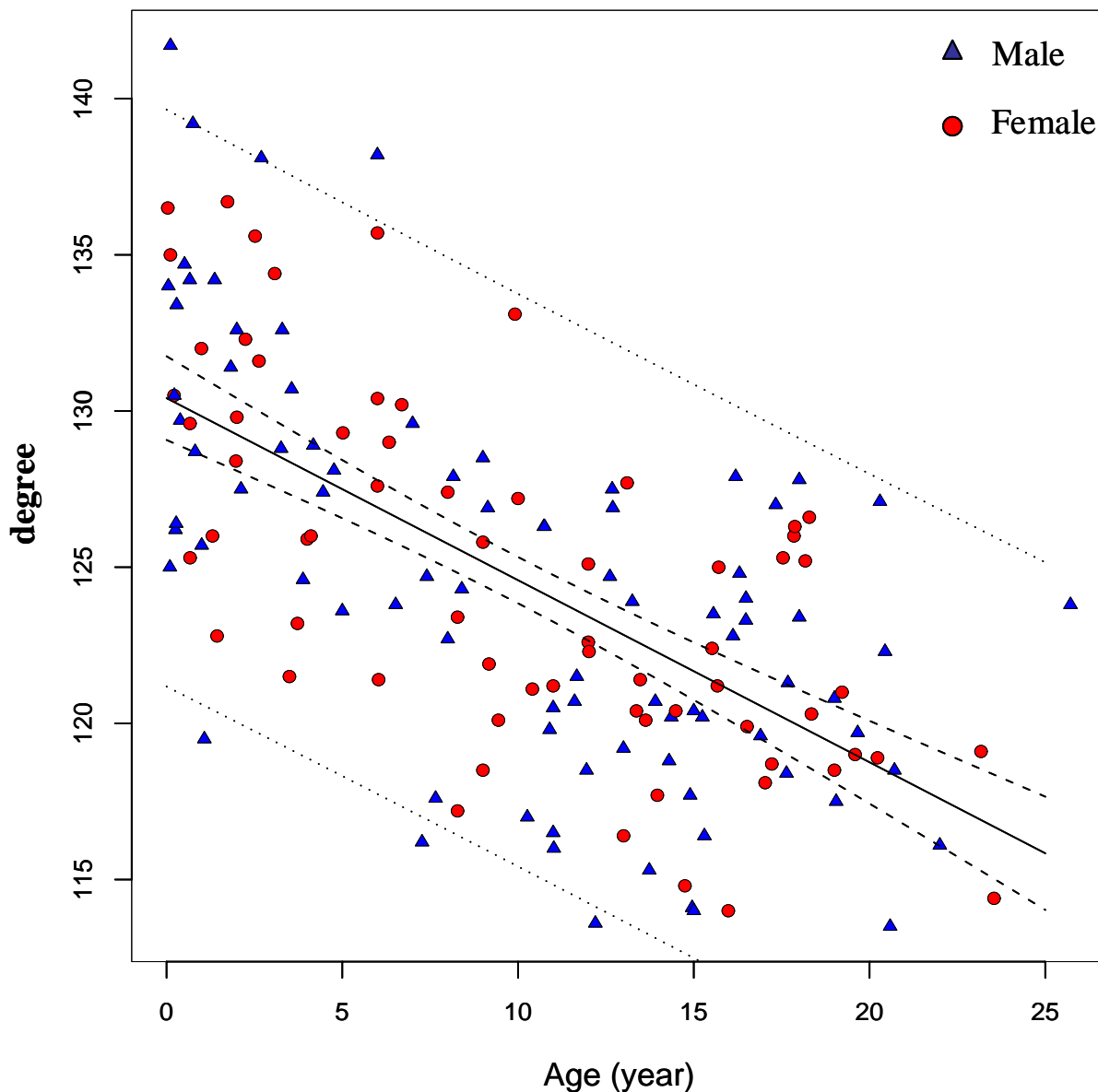
Age group	Males					Females					Total				
	N	M	SD	Min	Max	N	M	SD	Min	Max	N	M	SD	Min	Max
0-5	17	70.3	5.58	62.5	84.0	12	72.2	5.65	66.6	84.4	29	71.1	5.59	62.5	84.4
5-10	6	65.7	3.57	61.2	69.4	5	66.2	4.46	62.6	73.5	11	65.9	3.79	61.2	73.5
10-15	17	65.7	4.36	57.7	73.5	8	63.5	4.58	55.0	68.9	25	65.0	4.46	55.0	73.5
15-20	15	66.3	3.64	58.0	72.3	8	63.6	2.27	60.2	67.2	23	65.3	3.43	58.0	72.3
20-25	7	64.6	6.20	54.9	72.8	3	60.9	2.41	58.6	63.4	10	63.5	5.49	54.9	72.8



**Figure 3.107** Graph for petrous posterius anterior angle (*petp.l-es-petp.r*) versus age for males and females combined from birth to adulthood.

**Table 3.107** Means (M), standard deviations (SD), minimum and maximum values (in degree) for petrous posterius anterior angle (*petp.l-es-petp.r*) at different age intervals.

Age group	Males					Females					Total				
	N	M	SD	Min	Max	N	M	SD	Min	Max	N	M	SD	Min	Max
0-5	9	77.9	4.13	72.5	84.9	7	78.5	4.01	71.9	84.3	16	78.2	3.96	71.9	84.9
5-10	12	76.0	3.94	69.7	81.7	20	76.6	4.60	68.0	85.8	32	76.4	4.31	68.0	85.8
10-15	24	74.1	3.44	66.3	80.6	19	74.5	4.42	67.5	82.3	43	74.2	3.86	66.3	82.3
15-20	19	73.6	4.26	66.8	81.1	16	73.6	2.68	68.7	78.6	35	73.6	3.58	66.8	81.1
20-25	7	70.4	1.97	66.3	72.1	3	71.1	2.93	68.4	74.2	10	70.6	2.14	66.3	74.2

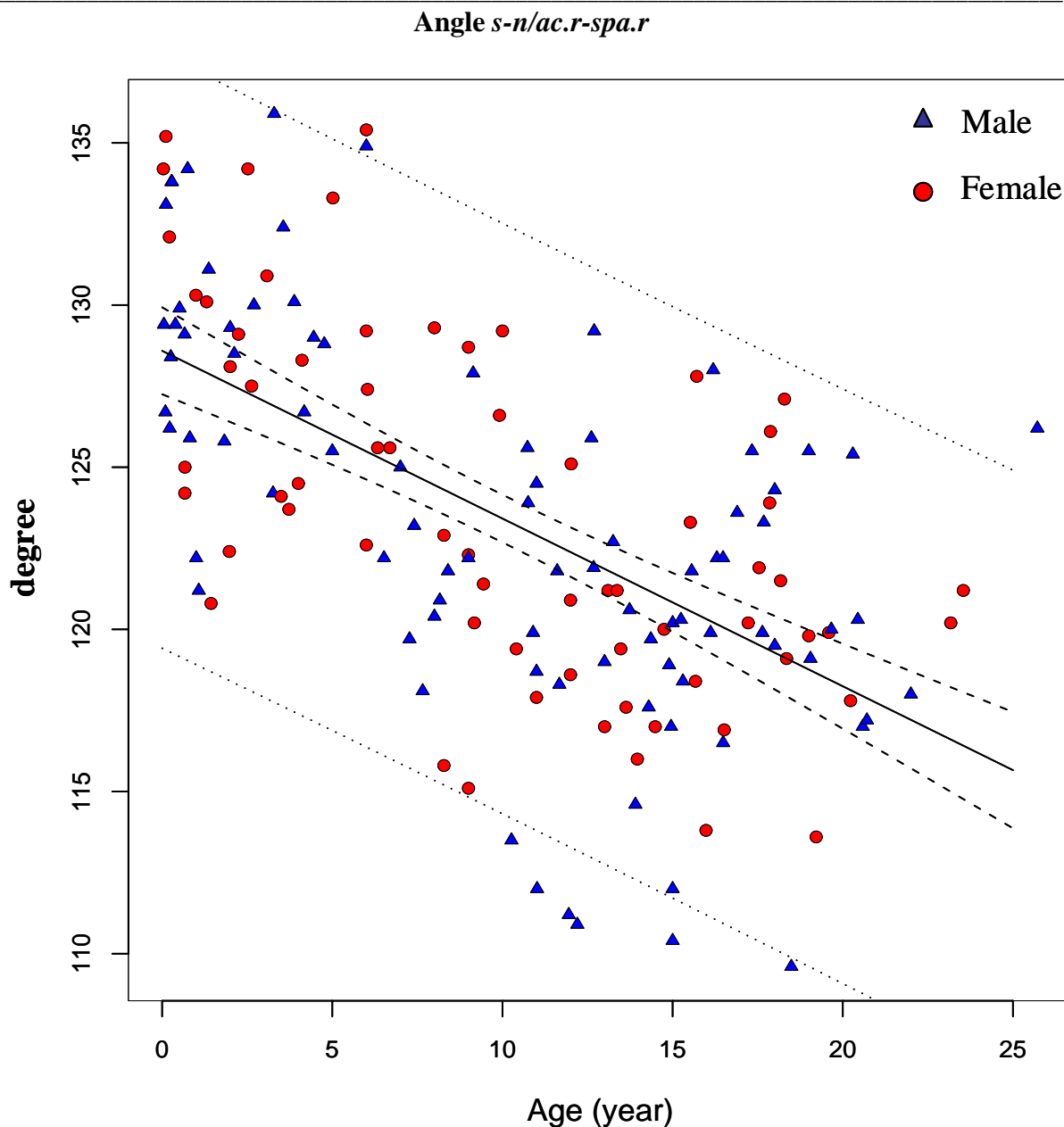
Angle  $s-n/ac.l-spa.l$ 

**Figure 3.108** Graph of angle  $s-n/ac.l-spa.l$  versus age for males and females combined from birth to adulthood.

**Table 3.108** Means (M), standard deviations (SD), minimum and maximum values (in degree) for angle  $s-n/ac.l-spa.l$  at different age intervals.

Age group	Males					Females					Total				
	N	M	SD	Min	Max	N	M	SD	Min	Max	N	M	SD	Min	Max
0-5	27	130.3	5.03	119.5	141.7	19	129.6	4.81	121.5	136.7	46	130.0	4.90	119.5	141.7
5-10	11	125.5	5.97	116.2	138.2	16	126.1	5.29	117.2	135.7	27	125.9	5.48	116.2	138.2
10-15	24	120.0	4.20	113.6	127.5	13	120.9	3.39	114.8	127.7	37	120.3	3.91	113.6	127.7
15-20	17	122.3	3.46	116.4	127.9	16	121.7	3.70	114.0	126.6	33	122.0	3.53	114.0	127.9
20-25	6	120.2	5.09	113.5	127.1	3	117.5	2.66	114.4	119.1	9	119.3	4.46	113.5	127.1

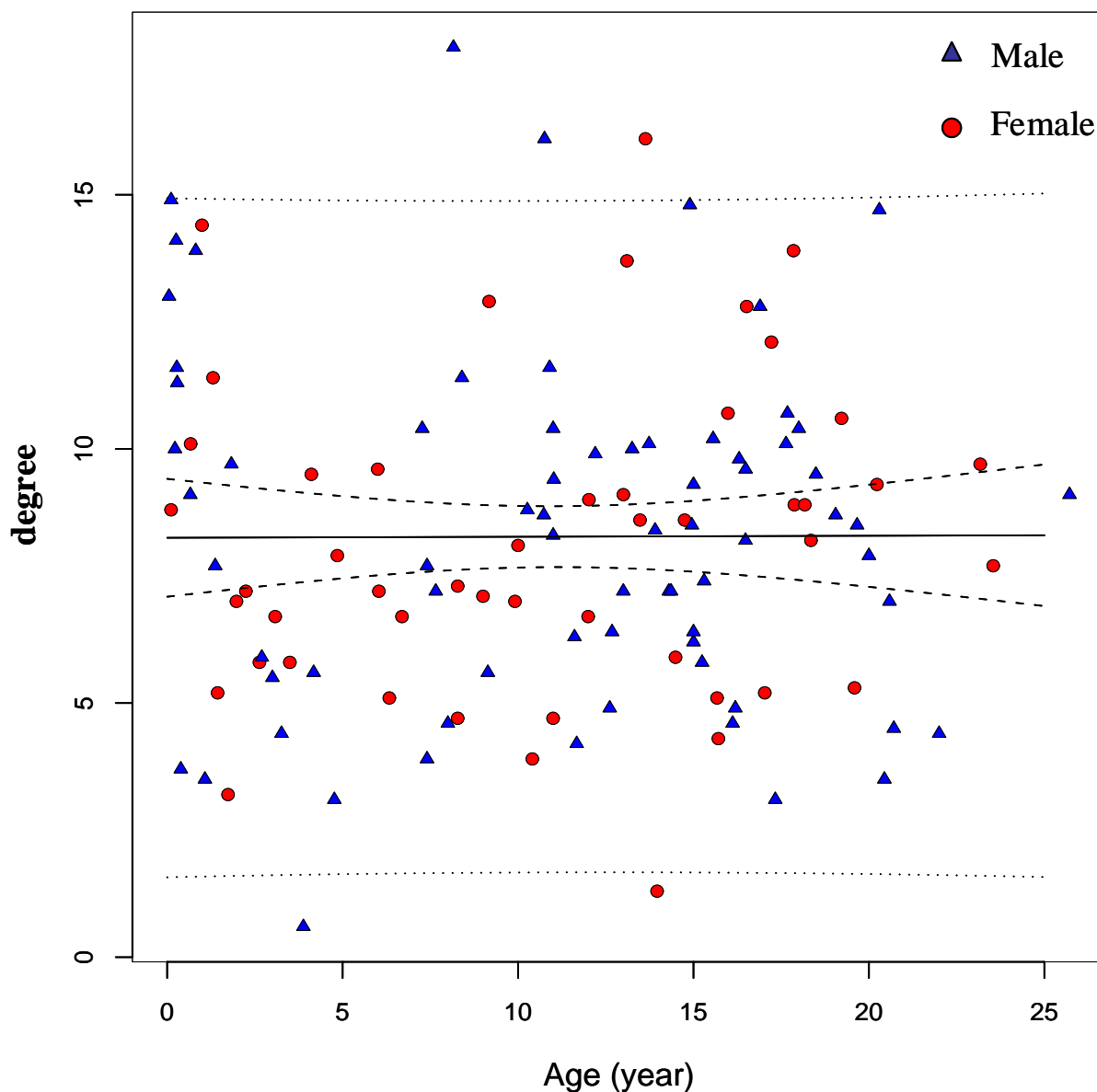




**Figure 3.109** Graph of angle *s-n/ac.r-spa.r* versus age for males and females combined from birth to adulthood.

**Table 3.109** Means (M), standard deviations (SD), minimum and maximum values (in degree) for angle *s-n/ac.r-spa.r* at different age intervals.

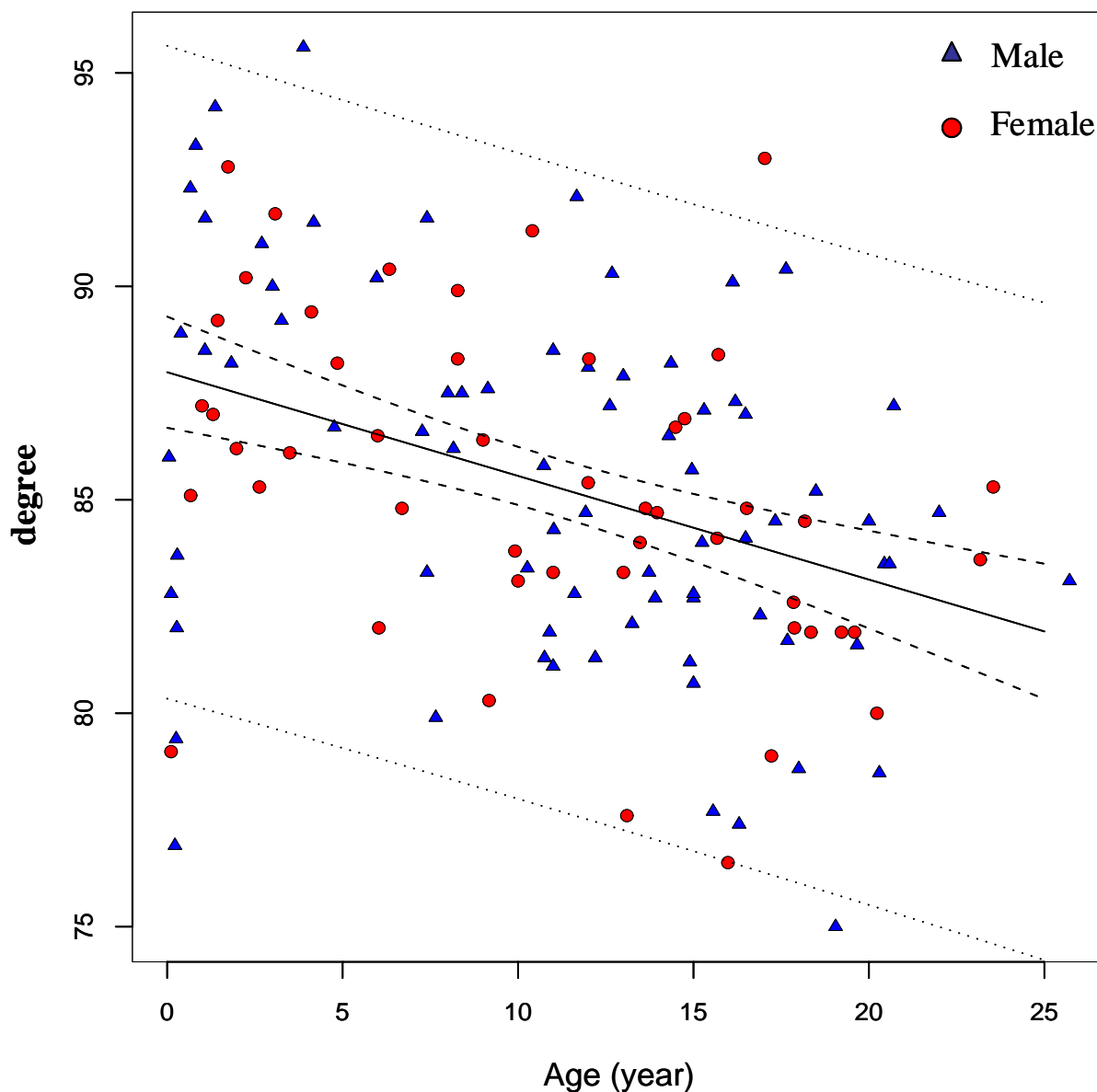
Age group	Males					Females					Total				
	N	M	SD	Min	Max	N	M	SD	Min	Max	N	M	SD	Min	Max
0-5	27	128.9	3.61	121.2	135.9	18	128.0	4.32	120.8	135.2	45	128.6	3.88	120.8	135.9
5-10	11	123.3	4.66	118.1	134.9	17	125.3	5.52	115.1	135.4	28	124.5	5.21	115.1	135.4
10-15	25	118.8	5.16	110.4	129.2	13	119.3	2.43	116.0	125.1	38	119.0	4.38	110.4	129.2
15-20	18	121.1	4.08	109.6	128.0	15	120.9	4.32	113.6	127.8	33	121.0	4.12	109.6	128.0
20-25	6	120.7	4.14	117.0	126.2	3	119.7	1.75	117.8	121.2	9	120.4	3.42	117.0	126.2

Cranial base/palatal plane angle (*s-n/ans.pns*)

**Figure 3.110** Graph of cranial base/palatal plane angle (*s-n/ans-pns*) versus age for males and females combined from birth to adulthood.

**Table 3.110** Means (M), standard deviations (SD), minimum and maximum values (in degree) for cranial base/palatal plane angle (*s-n/ans-pns*) at different age intervals.

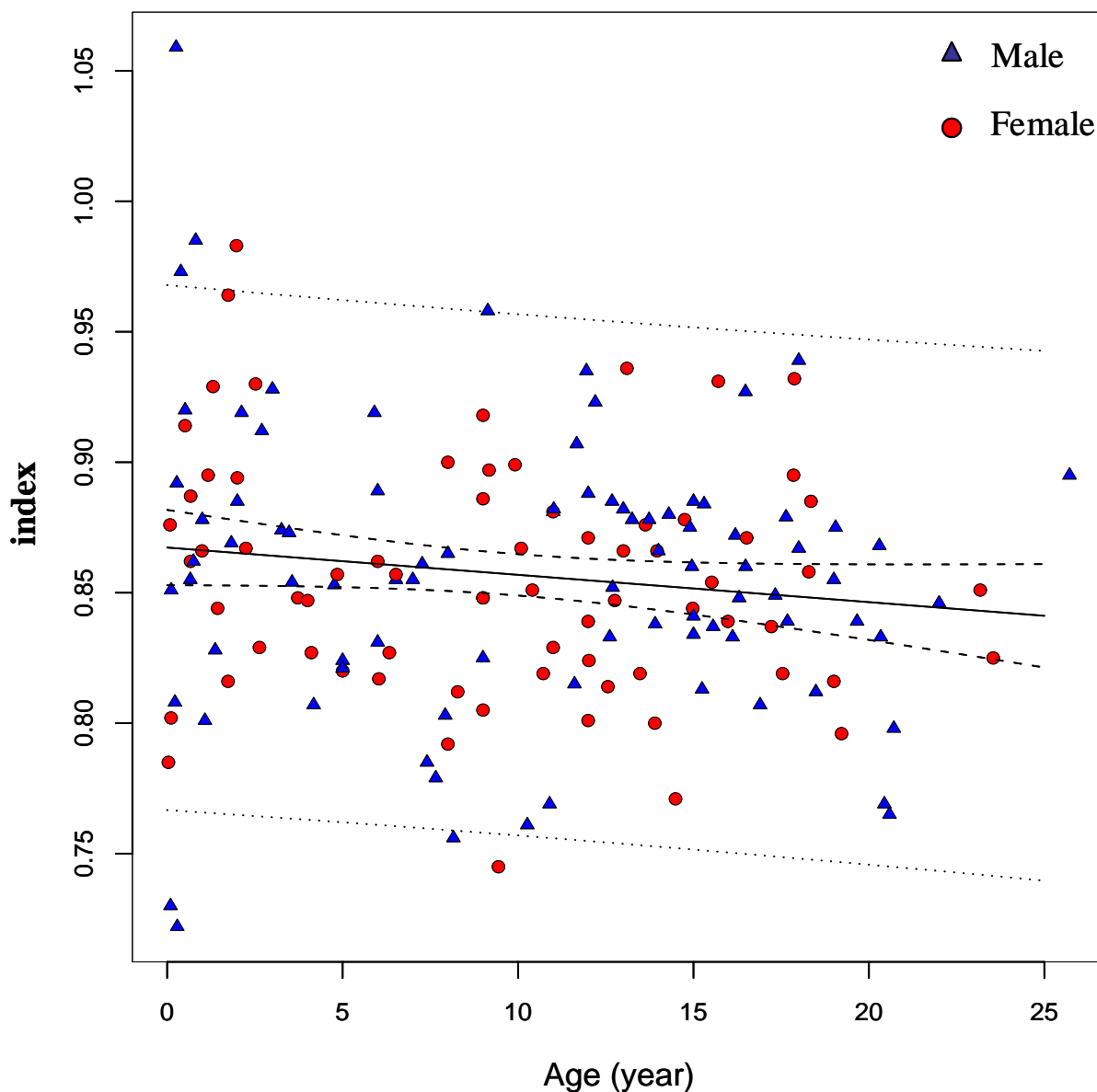
Age group	Males					Females					Total				
	N	M	SD	Min	Max	N	M	SD	Min	Max	N	M	SD	Min	Max
0-5	18	8.2	4.36	0.6	14.9	13	7.9	2.94	3.2	14.4	31	8.1	3.77	0.6	14.9
5-10	8	8.6	4.59	3.9	17.9	10	7.6	2.33	4.7	12.9	18	8.0	3.44	3.9	17.9
10-15	23	8.7	2.81	4.2	16.1	11	8.0	4.24	1.3	16.1	34	8.5	3.29	1.3	16.1
15-20	17	8.4	2.53	3.1	12.8	12	8.8	3.29	4.3	13.9	29	8.6	2.82	3.1	13.9
20-25	6	7.2	4.21	3.5	14.7	3	8.9	1.06	7.7	9.7	9	7.8	3.48	3.5	14.7

Palatal plane/face height angle (*n-ans/ans.pns*)

**Figure 3.111** Graph of palatal plane/face height angle (*n-ans/ans-pns*) versus age for males and females combined from birth to adulthood.

**Table 3.111** Means (M), standard deviations (SD), minimum and maximum values (in degree) for palatal plane/face height angle (*n-ans/ans-pns*) at different age intervals.

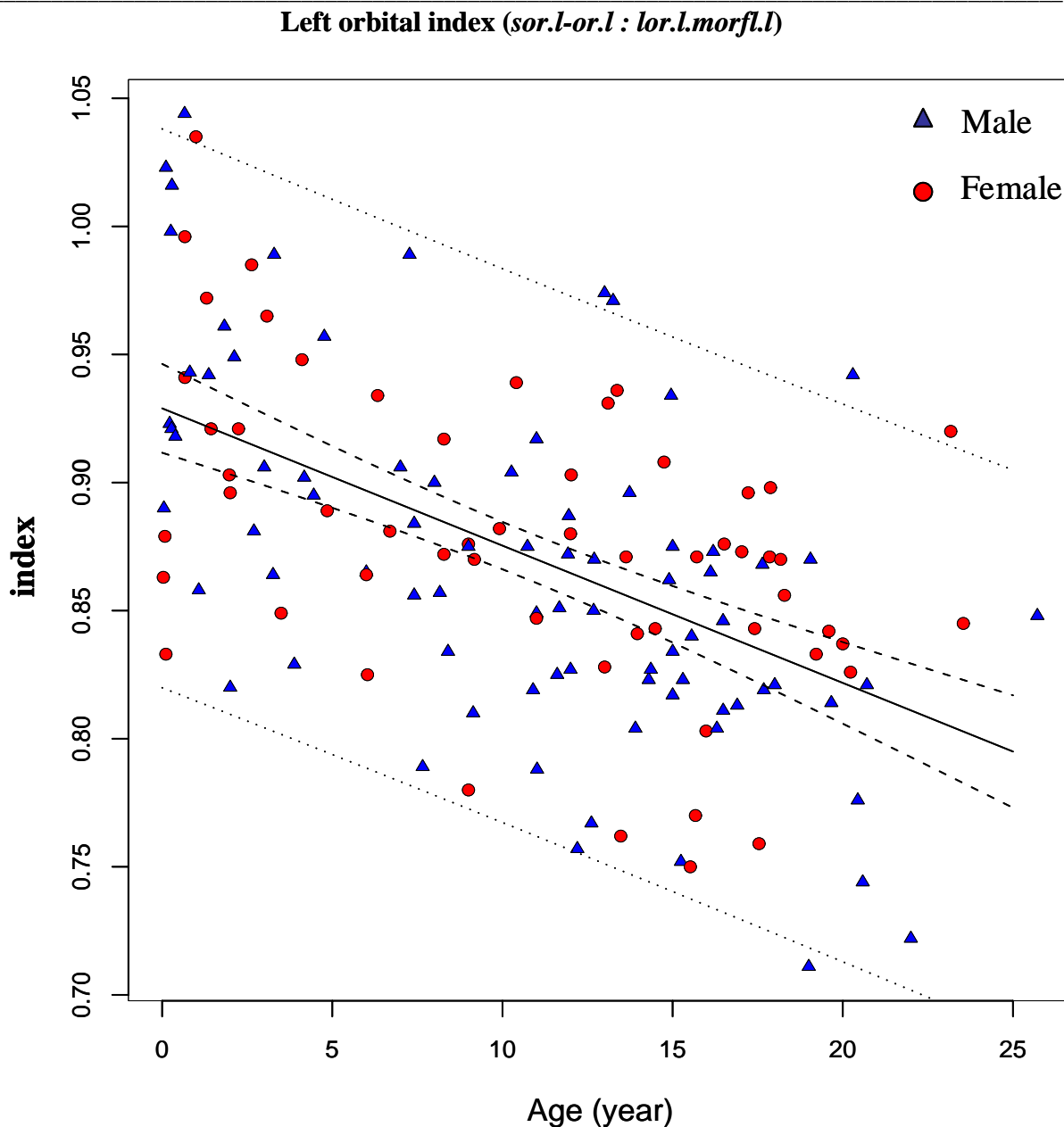
Age group	Males					Females					Total				
	N	M	SD	Min	Max	N	M	SD	Min	Max	N	M	SD	Min	Max
0-5	19	88.0	5.10	76.9	95.6	13	87.5	3.48	79.1	92.8	32	87.8	4.45	76.9	95.6
5-10	9	86.7	3.47	79.9	91.6	10	85.6	3.36	80.3	90.4	19	86.1	3.37	79.9	91.6
10-15	25	84.7	3.19	80.7	92.1	11	85.1	3.45	77.6	91.3	36	84.8	3.23	77.6	92.1
15-20	17	83.4	4.41	75.0	90.4	12	83.4	4.23	76.5	93.0	29	83.4	4.26	75.0	93.0
20-25	6	83.4	2.80	78.6	87.2	3	83.0	2.71	80.0	85.3	9	83.3	2.61	78.6	87.2

Cephalic index (*cindx.l-cindx.r : cindx.a-cindx.p*)

**Figure 3.112** Graph of cephalic index (*cindx.l-cindx.r : cindx.a-cindx.p*) versus age for males and females combined from birth to adulthood.

**Table 3.112** Means (M), standard deviations (SD), minimum and maximum values for cephalic index (*cindx.l-cindx.r : cindx.a-cindx.p*) at different age intervals.

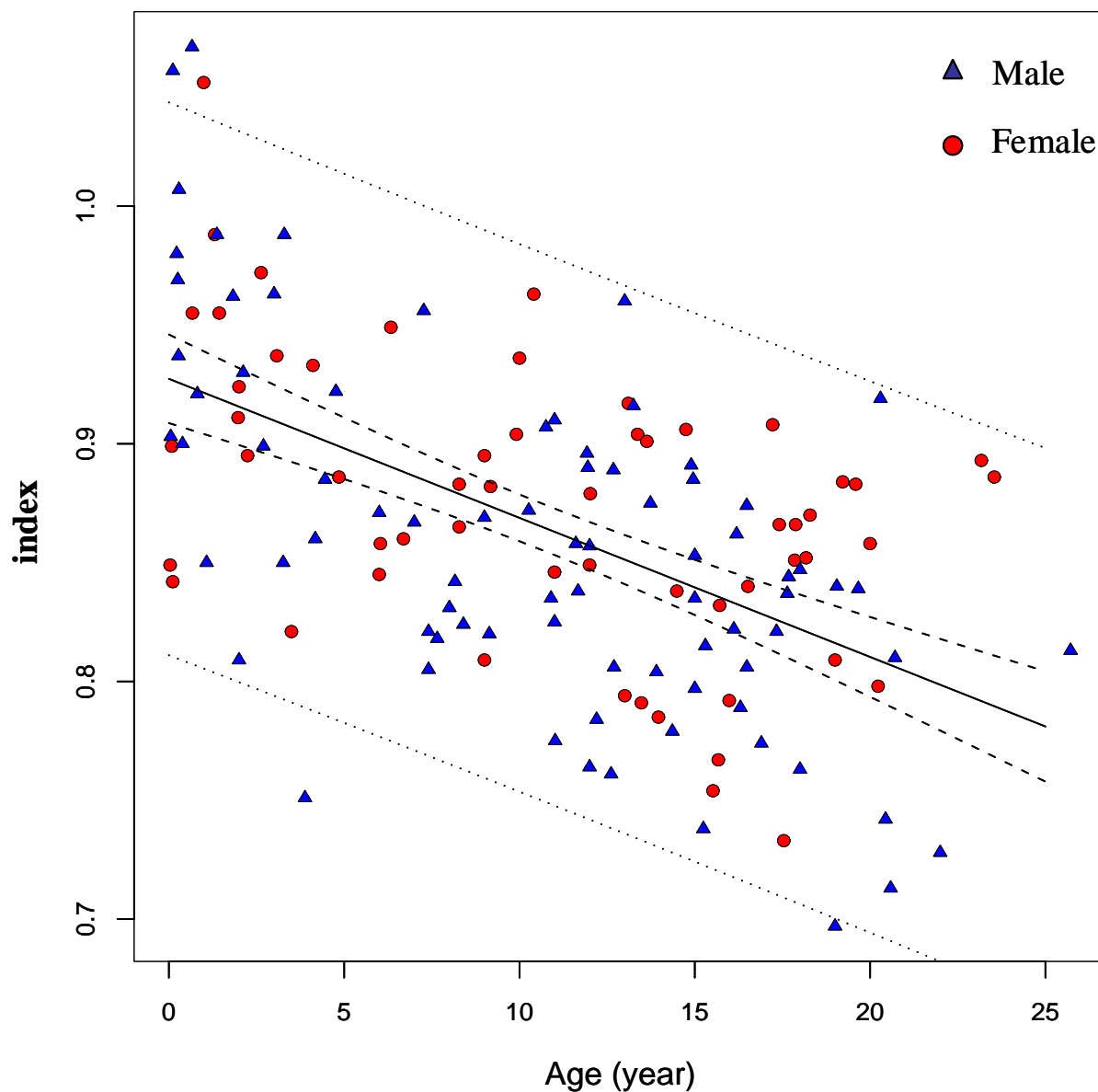
Age group	Males					Females					Total				
	N	M	SD	Min	Max	N	M	SD	Min	Max	N	M	SD	Min	Max
0-5	25	0.86	0.06	0.72	0.99	22	0.87	0.05	0.79	0.98	47	0.87	0.06	0.72	0.99
5-10	13	0.84	0.06	0.76	0.96	15	0.85	0.05	0.75	0.92	28	0.85	0.05	0.75	0.96
10-15	23	0.86	0.04	0.76	0.94	20	0.84	0.04	0.77	0.94	43	0.85	0.04	0.76	0.94
15-20	18	0.86	0.04	0.81	0.94	12	0.86	0.04	0.80	0.93	30	0.86	0.04	0.80	0.94
20-25	7	0.82	0.05	0.77	0.90	2	0.84	0.02	0.83	0.85	9	0.83	0.04	0.77	0.90



**Figure 3.113** Graph of left orbital index (*lor.l-or.l* : *lor.l.morfl.l*) versus age for males and females combined from birth to adulthood.

**Table 3.113** Means (M), standard deviations (SD), minimum and maximum values for left orbital index (*lor.l-or.l* : *lor.l.morfl.l*) at different age intervals.

Age group	Males					Females					Total				
	N	M	SD	Min	Max	N	M	SD	Min	Max	N	M	SD	Min	Max
0-5	22	0.93	0.06	0.82	1.04	16	0.92	0.06	0.83	1.04	38	0.93	0.06	0.82	1.04
5-10	11	0.87	0.05	0.79	0.99	10	0.87	0.04	0.78	0.93	21	0.87	0.05	0.78	0.99
10-15	26	0.86	0.05	0.76	0.97	12	0.87	0.05	0.76	0.94	38	0.86	0.05	0.76	0.97
15-20	15	0.82	0.04	0.71	0.87	16	0.84	0.05	0.75	0.90	31	0.83	0.05	0.71	0.90
20-25	6	0.81	0.08	0.72	0.94	3	0.86	0.05	0.83	0.92	9	0.83	0.07	0.72	0.94

Right orbital index ( $sor.r-or.r : lor.r-morfl.r$ )

**Figure 3.114** Graph of right orbital index ( $sor.r-or.r : lor.r-morfl.r$ ) versus age for males and females combined from birth to adulthood.

**Table 3.114** Means (M), standard deviations (SD), minimum and maximum values for right orbital index ( $sor.r-or.r : lor.r-morfl.r$ ) at different age intervals.

Age group	Males					Females					Total				
	N	M	SD	Min	Max	N	M	SD	Min	Max	N	M	SD	Min	Max
0-5	22	0.93	0.08	0.75	1.07	15	0.92	0.06	0.82	1.05	37	0.92	0.07	0.75	1.07
5-10	11	0.85	0.04	0.81	0.96	11	0.88	0.04	0.81	0.95	22	0.86	0.04	0.81	0.96
10-15	26	0.85	0.05	0.76	0.96	12	0.86	0.06	0.79	0.96	38	0.85	0.05	0.76	0.96
15-20	16	0.81	0.05	0.70	0.87	16	0.84	0.05	0.73	0.91	32	0.82	0.05	0.70	0.91
20-25	6	0.79	0.08	0.71	0.92	3	0.86	0.05	0.80	0.89	9	0.81	0.08	0.71	0.92

**Table 3.115** Differences in measurements for cranial vault variables in males and females between 0-1 years and adulthood, and between 3-5 years and adulthood, as well as percentages of the differences.

Measurement	Sex	Differences in measurement between 0-1 years and adulthood			Differences in measurement between 3-5 years and adulthood		
		Mean at 0-1 year interval (mm)	Measurement difference Mean (mm)	% of adult value Mean (%)	Mean at 3-5 year interval (mm)	Measurement difference Mean (mm)	% of adult value Mean (%)
Maximum cranial width (cindx.l-cindx.r)	M	113.9	31.1	78.6	138.8	6.1	95.8
	F	108.3	33.8 } 32.5	76.2 } 77.4	133.8	8.3 } 7.2	94.2 } 95.0
Interasterion width (as.l-as.r)	M	79.8	29.3	73.2	104.2	4.9	95.5
	F	78.4	31.1 } 30.2	71.6 } 72.4	102.5	7.0 } 6.0	93.6 } 94.6
Interporion width (po.l-po.r)	M	72.7	45.4	61.6	101.1	17.1	85.5
	F	63.4	50.0 } 47.7	55.9 } 58.8	94.2	19.2 } 18.2	83.1 } 84.3
Cranial height (ba-br)	M	104.4	33.9	75.5	128.2	10.1	92.7
	F	97.3	36.7 } 35.3	72.6 } 74.1	126.8	7.2 } 8.7	94.6 } 93.7
Left cranial vault height (br-po.l)	M	104.7	27.6	79.1	125.7	6.6	95.0
	F	96.3	32.9 } 30.3	74.6 } 76.9	122.0	7.1 } 6.9	94.5 } 94.8
Right cranial vault height (br-po.r)	M	104.5	27.8	79.0	126.7	5.7	95.7
	F	92.1	37.8 } 32.8	70.9 } 75.0	121.5	8.5 } 7.1	93.5 } 94.6
Anterior cranial vault height (n-br)	M	82.4	32.0	72.0	105.6	8.8	92.3
	F	76.9	35.9 } 34.0	68.2 } 70.1	103.0	9.8 } 9.3	91.3 } 91.8
Posterior cranial vault height (l-br)	M	88.4	19.9	81.6	106.5	1.9	98.3
	F	85.3	19.7 } 19.8	81.2 } 81.4	100.3	4.7 } 3.3	95.5 } 96.9
Lambdoid height (l-o)	M	77.0	26.2	74.6	95.6	7.5	92.7
	F	77.1	23.0 } 24.6	77.0 } 75.8	94.5	5.7 } 6.6	94.3 } 93.5
Maximum cranial length (cindxa-cindxp)	M	129.4	45.0	74.2	164.6	9.8	94.4
	F	126.2	43.5 } 44.3	74.4 } 74.3	159.4	10.3 } 10.1	93.9 } 94.2
Left lateral cranial vault length (spc.l-as.l)	M	65.4	33.5	66.2	87.1	11.8	88.0
	F	63.2	32.1 } 32.8	66.3 } 66.3	82.6	12.7 } 12.3	86.7 } 87.4
Right lateral cranial vault length (spc.r-as.r)	M	66.2	33.7	66.3	88.0	11.9	88.1
	F	63.7	30.3 } 32.0	67.7 } 67.0	82.1	11.8 } 11.9	87.4 } 87.8

**Table 3.116** Differences in measurements for cranial base variables in males and females between 0-1 years and adulthood, and between 3-5 years and adulthood, as well as percentages of the differences.

Measurement	Sex	Differences in measurement between 0-1 years and adulthood			Differences in measurement between 3-5 years and adulthood		
		Mean at 0-1 year interval (mm)	Measurement difference Mean (mm)	% of adult value Mean (%)	Mean at 3-5 year interval (mm)	Measurement difference Mean (mm)	% of adult value Mean (%)
Anterior cranial base width (spa.l-spa.r)	M	44.5	36.7	54.8	62.8	18.4	77.3
	F	41.6	36.4 } 36.6	53.3 } 54.1	63.3	14.7 } 16.6	81.2 } 79.3
Anterior clinoid width (ac.l-ac.r)	M	15.4	10.0	60.6	21.2	4.3	83.2
	F	16.2	7.7 } 8.9	67.9 } 64.3	20.3	3.6 } 4.0	85.1 } 84.2
Superior SOS width (petsa.l-petsa.r)	M	17.9	8.4	68.1	22.0	4.3	83.6
	F	17.7	7.9 } 8.2	69.1 } 68.6	19.3	6.3 } 5.3	75.5 } 79.6
Inferior SOS width (pts.l-pts.r)	M	14.6	12.2	54.4	20.1	6.8	74.7
	F	14.6	11.9 } 12.1	55.2 } 54.8	20.0	6.5 } 6.7	75.5 } 75.1
Posterior cranial fossa width (petp.l-petp.r)	M	82.4	27.8	74.8	104.0	6.1	94.4
	F	79.4	28.9 } 28.4	73.3 } 74.1	98.5	9.8 } 8.0	91.0 } 92.7
External cranial base width (ss.l-ss.r)	M	46.0	20.2	69.5	57.8	8.4	87.3
	F	41.9	22.6 } 21.4	64.9 } 67.2	52.8	11.7 } 10.1	81.8 } 84.6
Foramen magnum width (fmlhg.l-fmlhg.r)	M	21.7	8.6	71.7	28.8	1.5	95.1
	F	20.7	8.6 } 8.6	70.7 } 71.2	26.8	2.5 } 2.0	91.4 } 93.3
Left anterior cranial fossa length (sor.l-spa.l)	M	25.7	18.4	58.2	35.4	8.7	80.3
	F	26.1	16.3 } 17.4	61.6 } 59.9	34.2	8.1 } 8.4	80.8 } 80.6
Right anterior cranial fossa length (sor.r-spa.r)	M	26.3	17.5	60.1	35.1	8.7	80.2
	F	26.6	15.6 } 16.6	63.1 } 61.6	33.7	8.5 } 8.6	79.9 } 80.1
Left lateral middle cranial fossa length (spa.l-petp.l)	M	51.3	18.9	73.1	64.1	6.1	91.4
	F	49.0	19.1 } 19.0	72.0 } 72.6	61.5	6.6 } 6.4	90.3 } 90.9
Right lateral middle cranial fossa length (spa.r-petp.r)	M	52.4	18.2	74.2	65.3	5.3	92.4
	F	48.5	18.6 } 18.4	72.3 } 73.3	59.8	7.2 } 6.3	89.2 } 90.8
Left petrous ridge length (petsa.l-petp.l)	M	40.6	14.0	74.4	51.1	3.5	93.6
	F	39.2	14.1 } 14.1	73.6 } 74.0	48.8	4.5 } 4.0	91.6 } 92.6
Right petrous ridge length (petsa.r-petp.r)	M	40.9	14.0 } 14.2	74.5 } 74.0	51.9	2.9 } 3.5	94.7 } 93.6
	F	39.5	14.3	73.4	49.7	4.0	92.5
Left SOS length (pts.l-petsa.l)	M	9.9	9.2	51.9	13.9	5.3	72.3
	L	10.4	8.3 } 8.8	55.6 } 53.8	12.9	5.8 } 5.6	69.2 } 70.8
Right SOS length (pts.r-petsa.r)	M	9.9	9.0 } 9.0	52.4 } 52.5	13.6	5.2 } 5.6	72.3 } 70.1
	L	9.8	8.9	52.5	12.7	6.0	67.9
Foramen magnum length (ba-o)	M	29.1	4.4	86.9	34.5	-1.0	102.9
	F	29.5	3.8 } 4.1	88.5 } 87.7	32.6	0.7 } -0.2	97.8 } 100.4
Posterior inferior cranial base length (ba-h)	M	24.1	7.7	75.7	28.6	3.2	89.8
	F	24.1	5.9 } 6.8	80.3 } 78.0	28.0	2.0 } 2.6	93.2 } 91.5
Medial cranial base length (ba-n)	M	64.2	38.1	62.7	86.1	16.2	84.2
	F	65.9	29.5 } 33.8	69.1 } 65.9	82.3	13.0 } 14.6	86.3 } 85.3
Anterior medial cranial base length (s-n)	M	43.1	25.2	63.2	58.8	9.5	86.1
	F	42.8	21.0 } 23.1	67.1 } 65.2	55.5	8.3 } 8.9	87.0 } 86.6
Posterior medial cranial base length (ba-s)	M	26.1	19.4	57.4	35.5	9.9	78.2
	F	24.6	17.7 } 18.6	58.2 } 57.8	33.1	9.3 } 9.6	78.1 } 78.2

SOS = Spheno-occipital synchondrosis



**Table 3.117** Differences in measurements for orbital variables in males and females between 0-1 years and adulthood, and between 3-5 years and adulthood, as well as percentages of the differences.

Measurement	Sex	Differences in measurement between 0-1 years and adulthood			Differences in measurement between 3-5 years and adulthood		
		Mean at 0-1 year interval (mm)	Measurement difference Mean (mm)	% of adult value Mean (%)	Mean at 3-5 year interval (mm)	Mean at 0-1 year interval (mm)	% of adult value Mean (%)
Anterior superior orbital width (sor.l-sor.r)	M	43.0	18.3	70.2	50.7	10.6	82.7
	F	41.8	14.6 } 16.5	74.1 } 72.2	50.1	6.5 } 8.6	88.8 } 85.8
Interorbital width (morfl.l-morfl.r)	M	16.2	4.3	79.2	18.5	2.0	90.4
	F	14.9	5.0 } 4.7	75.0 } 77.1	17.5	2.4 } 2.2	87.8 } 89.1
Maximum orbital width (lor.l-lor.r)	M	67.2	32.1	67.7	82.6	16.6	83.2
	F	65.1	27.6 } 29.9	70.2 } 69.0	80.9	11.8 } 14.2	87.3 } 85.3
Anterior inferior orbital width (or.l-or.r)	M	37.3	18.7	66.6	43.2	12.8	77.1
	F	35.1	16.3 } 17.5	68.3 } 67.5	41.6	9.8 } 11.3	81.0 } 79.1
Posterior orbital width (ofa.l-ofa.r)	M	17.0	13.6	55.6	22.7	7.9	74.0
	F	17.6	10.5 } 12.1	62.5 } 59.1	21.7	6.4 } 7.2	77.1 } 75.6
Left orbital distance (lor.l-morf.ll)	M	26.7	14.5	64.8	33.6	7.6	81.5
	F	26.5	11.8 } 13.2	69.2 } 67.0	33.4	4.9 } 6.3	87.2 } 84.4
Right orbital distance (lor.r-morf.lr)	M	26.8	14.6	64.8	33.7	7.7	81.5
	F	26.3	11.6 } 13.1	69.4 } 67.1	33.8	4.2 } 6.0	88.9 } 85.2
Left orbital height (sor.l-or.l)	M	25.7	7.5	77.4	30.5	2.8	91.6
	F	24.6	8.1 } 7.8	75.3 } 76.4	30.5	2.2 } 2.5	93.3 } 92.5
Right orbital height (sor.r-or.r)	M	26.0	6.3	80.6	29.5	2.8	91.4
	F	23.7	8.9 } 7.6	72.7 } 76.7	30.2	2.4 } 2.6	92.6 } 92.0
Left superior orbital length (ofa.l-sor.l)	M	36.0	13.9	72.2	45.8	4.1	91.7
	F	34.4	13.3 } 13.6	72.0 } 72.1	44.7	3.0 } 3.6	93.8 } 92.8
Right superior orbital length (ofa.r-sor.r)	M	36.3	13.1	73.4	45.7	3.7	92.5
	F	34.7	13.0 } 13.1	72.8 } 73.1	44.3	3.4 } 3.6	92.9 } 92.7
Left inferior orbital length (ofa.l-or.l)	M	29.7	18.2	62.0	41.4	6.5	86.4
	F	29.8	15.1 } 16.7	66.5 } 64.3	39.7	5.2 } 5.9	88.3 } 87.4
Right inferior orbital length (ofa.r-or.r)	M	29.9	18.1	62.3	41.9	6.2	87.1
	F	28.9	16.5 } 17.3	63.6 } 63.0	39.4	6.0 } 6.1	86.8 } 87.0
Left medial orbital length (ofa.l-morfl.l)	M	27.7	15.3	64.4	39.4	3.6	91.7
	F	27.6	13.9 } 14.6	66.6 } 65.5	37.2	4.3 } 4.0	89.6 } 90.7
Right medial orbital length (ofa.r-morfl.r)	M	27.9	15.6	64.2	39.3	4.2	90.4
	F	27.3	14.6 } 15.1	65.2 } 64.7	36.8	5.1 } 4.7	87.9 } 89.2
Left lateral orbital length (ofa.l-slo.rl)	M	34.1	13.9	71.0	42.7	5.3	88.9
	F	33.3	13.7 } 13.8	70.8 } 70.9	41.5	5.6 } 5.5	88.1 } 88.5
Right lateral orbital length (ofa.r-slor.r)	M	34.2	14.0	71.0	42.8	5.4	88.9
	F	33.4	13.5 } 13.8	71.3 } 71.2	41.1	5.8 } 5.6	87.6 } 88.3

**Table 3.118** Differences in measurements for nasal variables in males and females between 0-1 years and adulthood, and between 3-5 years and adulthood, as well as percentages of the differences.

Measurement	Sex	Differences in measurement between 0-1 years and adulthood			Differences in measurement between 3-5 years and adulthood		
		Mean at 0-1 year interval (mm)	Measurement difference Mean (mm)	% of adult value Mean (%)	Mean at 3-5 year interval (mm)	Mean at 0-1 year interval (mm)	% of adult value Mean (%)
Superior nasal width (snm.l-snm.r)	M	10.2	0.3	97.0	11.1	-0.6	105.5
	F	9.8	0.2 } 0.3	97.8 } 97.4	9.0	1.0 } 0.2	90.0 } 97.8
Inferior nasal width (inm.l-inm.r)	M	10.5	4.9	68.5	13.7	1.7	89.0
	F	10.7	4.5 } 4.7	70.2 } 69.4	13.6	1.6 } 1.7	89.3 } 89.2
Nasal aperture width (al.l-al.r)	M	16.2	4.6	77.8	19.7	1.2	94.3
	F	15.2	6.3 } 5.5	70.8 } 74.3	19.1	2.4 } 1.8	88.8 } 91.6
Left nasal height (n-al.l)	M	24.2	25.5	48.7	36.8	13.0	73.9
	F	25.0	23.5 } 24.5	51.5 } 50.1	34.0	14.5 } 13.8	70.0 } 72.0
Right nasal height (n-al.r)	M	24.3	25.5	48.8	36.5	13.3	73.3
	F	25.1	23.0 } 24.3	52.1 } 50.5	33.8	14.4 } 13.9	70.1 } 71.7
Nasal aperture height (na-ans)	M	14.5	15.3	48.6	19.6	10.2	65.8
	F	14.7	13.0 } 14.2	53.0 } 50.8	19.1	8.6 } 9.4	69.0 } 67.4
Posterior nasal height (pns-h)	M	10.4	12.4	45.6	18.6	4.2	81.5
	F	10.3	11.4 } 11.9	47.3 } 46.5	16.0	5.7 } 5.0	73.7 } 77.6
Left naso-maxillary suture length (inm.l-snm.l)	M	12.4	14.0	47.0	19.2	7.2	72.8
	F	12.5	12.3 } 13.2	50.3 } 48.7	17.8	7.0 } 7.1	71.9 } 72.4
Right naso-maxillary suture length (inm.r-snm.r)	M	12.3	13.8	47.1	18.8	7.3	72.0
	F	12.4	12.1 } 13.0	50.6 } 48.9	17.7	6.7 } 7.0	72.6 } 72.3
Nasal bone length (na-n)	M	12.0	13.0	48.1	18.7	6.3	74.8
	F	11.9	12.1 } 12.6	49.7 } 48.9	17.0	7.0 } 6.7	70.7 } 72.8
Vomerine length (h-ans)	M	37.7	32.1	54.0	55.0	14.8	78.8
	F	37.3	28.2 } 30.2	56.9 } 55.5	50.8	14.6 } 14.7	77.6 } 78.2

**Table 3.119** Differences in measurements for maxillary variables in males and females between 0-1 years and adulthood, and between 3-5 years and adulthood, as well as percentages of the differences.

Measurement	Sex	Differences in measurement between 0-1 years and adulthood			Differences in measurement between 3-5 years and adulthood		
		Mean at 0-1 year interval (mm)	Measurement difference Mean (mm)	% of adult value Mean (%)	Mean at 3-5 year interval (mm)	Mean at 0-1 year interval (mm)	% of adult value Mean (%)
Maximum maxillary width (zmi.l-zmi.r)	M	60.4	41.3	59.4	79.1	22.5	77.8
	F	56.1	38.8 } 40.1	59.1 } 59.3	74.0	20.9 } 21.7	78.0 } 77.9
Posterior superior maxillary width (ms.l-ms.r)	M	24.1	18.7	56.3	30.6	12.1	71.6
	F	23.5	16.3 } 17.5	59.0 } 57.7	27.5	12.3 } 12.2	69.1 } 70.4
Posterior inferior maxillary width (mxt.l-mxt.r)	M	26.7	21.0	56.0	37.0	10.6	77.7
	F	26.4	18.5 } 19.8	58.8 } 57.4	36.6	8.3 } 9.5	81.4 } 79.6
Posterior palatal width (gpf.l-gpf.r)	M	20.6	12.9	61.5	26.1	7.4	77.9
	F	20.4	11.4 } 12.2	64.2 } 62.9	24.0	7.8 } 7.6	75.6 } 76.8
Anterior upper face height (n-ans)	M	25.9	25.7	50.2	37.6	14.0	72.8
	F	26.9	22.1 } 23.9	54.9 } 52.6	35.4	13.7 } 13.9	72.1 } 72.5
Anterior maxillary alveolar height (ans-pr)	M	7.8	10.8	42.0	16.4	2.2	88.4
	F	7.8	10.0 } 10.4	43.7 } 42.9	13.8	4.0 } 3.1	77.5 } 83.0
Left posterior maxillary height (mxt.l-ms.l)	M	15.7	31.7	33.1	32.9	14.5	69.4
	F	15.3	26.6 } 29.2	36.5 } 34.8	28.7	13.1 } 13.8	68.7 } 69.1
Right posterior maxillary height (mxt.r-ms.r)	M	15.8	31.1	33.6	32.8	14.1	70.0
	F	15.3	27.1 } 29.1	36.0 } 34.8	29.3	13.1 } 13.6	69.1 } 69.6
Left anterior zygomaxillary suture length (or.l-zmi.l)	M	19.0	16.5	53.5	27.5	8.0	77.4
	F	17.3	16.0 } 16.3	51.9 } 52.7	26.5	6.9 } 7.5	79.3 } 78.4
Right anterior zygomaxillary suture length (or.r-zmi.r)	M	18.6	17.5	51.5	27.9	8.3	77.2
	F	17.3	16.3 } 16.9	51.6 } 51.6	26.4	7.2 } 7.8	78.7 } 78.0
Left inferior maxillary length (mxt.l-pr)	M	28.2	31.2	47.5	40.1	19.4	67.4
	L	28.9	28.7 } 30.0	50.1 } 48.8	39.8	17.8 } 18.6	69.1 } 68.3
Right inferior maxillary length (mxt.r-pr)	M	28.2	31.8	46.9	40.7	19.3	67.8
	L	28.2	28.8 } 30.3	49.5 } 48.2	39.5	17.5 } 18.4	69.3 } 68.6
Palatal length (pns-ans)	M	29.5	23.0	56.2	40.7	11.8	77.5
	F	29.4	19.1 } 21.1	60.6 } 58.4	38.8	9.7 } 10.8	79.9 } 78.7

**Table 3.120** Differences in measurements for zygomatic variables in males and females between 0-1 years and adulthood, and between 3-5 years and adulthood, as well as percentages of the differences.

Measurement	Sex	Differences in measurement between 0-1 years and adulthood			Differences in measurement between 3-5 years and adulthood		
		Mean at 0-1 year interval (mm)	Measurement difference Mean (mm)	% of adult value Mean (%)	Mean at 3-5 year interval (mm)	Mean at 0-1 year interval (mm)	% of adult value Mean (%)
Superior interzygomatic width (zt.l-zt.r)	M	73.9	44.1	62.6	94.1	23.9	79.8
	F	69.5	41.0 } 42.6	62.9 } 62.8	91.2	19.2 } 21.6	82.6 } 81.2
Inferior interzygomatic width (zti.l-zti.r)	M	74.7	50.9	59.5	97.9	27.7	78.0
	F	70.3	47.7 } 49.3	59.6 } 59.6	93.5	24.6 } 26.2	79.2 } 78.6
Left zygomatic height (slor.l-zmi.l)	M	25.0	19.6	56.1	34.6	10.0	77.7
	F	23.8	19.2 } 19.4	55.4 } 55.8	34.2	8.8 } 9.4	79.6 } 78.7
Right zygomatic height (slor.r-zmi.r)	M	24.9	19.1	56.6	34.5	9.6	78.3
	F	24.5	18.4 } 18.8	57.1 } 56.9	33.0	9.9 } 9.8	77.0 } 77.7
Left zygomatic length (zti.l-or.l)	M	29.6	24.2	55.0	42.3	11.5	78.7
	F	27.2	23.8 } 24.0	53.3 } 54.2	40.7	10.2 } 10.9	79.9 } 79.3
Right zygomatic length (zti.r-or.r)	M	30.1	24.0	55.6	42.2	11.9	78.0
	F	26.9	23.9 } 24.0	52.9 } 54.3	40.1	10.7 } 11.3	79.0 } 78.5
Left zygomatic arch length (zt.l-au.l)	M	18.7	22.7	45.3	29.2	12.2	70.4
	F	18.3	19.4 } 21.1	48.6 } 47.0	26.8	10.8 } 11.5	71.2 } 70.8
Right zygomatic arch length (zt.r-au.r)	M	19.2	22.7	45.8	29.0	13.0	69.1
	F	18.1	18.8 } 20.8	49.0 } 47.4	27.0	9.9 } 11.5	73.2 } 71.2

**Table 3.121** Differences in measurements for mandibular variables in males and females between 0-1 years and adulthood, and between 3-5 years and adulthood, as well as percentages of the differences.

Measurement	Sex	Differences in measurement between 0-1 years and adulthood			Differences in measurement between 3-5 years and adulthood		
		Mean at 0-1 year interval (mm)	Measurement difference Mean (mm)	% of adult value Mean (%)	Mean at 3-5 year interval (mm)	Mean at 0-1 year interval (mm)	% of adult value Mean (%)
Intergonial width (go.l-go.r)	M	52.9	39.5	} 37.4 57.2 } 57.9	71.0	21.5 } 18.0	76.8 } 80.0
	F	50.1	35.3				
Intercondylar width (cd.l-cd.r)	M	70.9	51.3	} 49.6 58.0 } 58.5	97.2	25.0 } 25.3	79.5 } 78.8
	F	69.0	47.9				
Left superior ramus distance (cd.l-ct.l)	M	14.7	16.8	} 15.9 46.6 } 47.9	22.7	8.7 } 8.0	72.3 } 73.9
	F	14.4	14.9				
Right superior ramus distance (cd.r-ct.r)	M	15.3	16.0	} 16.2 48.9 } 47.9	22.9	8.4 } 8.5	73.1 } 72.5
	F	14.4	16.3				
Anterior mandibular alveolar height (gn-id)	M	15.0	18.1	} 17.0 45.2 } 45.0	24.5	8.6 } 7.6	73.9 } 75.5
	F	12.8	15.8				
Left ramus height (cd.l-go.l)	M	19.7	36.4	} 32.1 35.1 } 38.4	37.9	18.1 } 15.9	67.6 } 69.5
	F	19.9	27.8				
Right ramus height (cd.r-go.r)	M	19.9	35.8	} 32.4 35.7 } 38.2	39.6	16.2 } 15.3	71.0 } 70.7
	F	19.8	28.9				
Left mandibular body length (go.l-gn)	M	44.5	42.4	} 42.2 51.2 } 50.4	65.1	21.9 } 22.5	74.9 } 73.6
	F	41.3	42.0				
Right mandibular body length (go.r-gn)	M	43.6	44.4	} 43.5 49.6 } 49.3	64.1	23.8 } 23.4	72.9 } 72.7
	F	40.9	42.6				
Left total mandible length (gn-cd.l)	M	58.5	64.4	} 60.3 47.6 } 48.9	92.1	30.9 } 29.2	74.9 } 75.3
	F	56.6	56.2				
Right total mandible length (gn-cd.r)	M	58.8	65.1	} 62.2 47.5 } 48.1	93.0	31.0 } 30.3	75.0 } 74.7
	F	56.2	59.2				

**Table 3.122** Differences in measurements for inter-regional variables in males and females between 0-1 years and adulthood, and between 3-5 years and adulthood, as well as percentages of the differences.

Measurement	Sex	Differences in measurement between 0-1 years and adulthood			Differences in measurement between 3-5 years and adulthood		
		Mean at 0-1 year interval (mm)	Measurement difference Mean (mm)	% of adult value Mean (%)	Mean at 3-5 year interval (mm)	Mean at 0-1 year interval (mm)	% of adult value Mean (%)
Left total face length (au.l-ans)	M	58.7	47.9	} 45.3 55.1 } 56.1	82.7	23.9 } 22.5	77.6 } 78.3
	F	56.8	42.7				
Right total face length (au.r-ans)	M	59.3	48.5	} 46.7 55.0 } 55.3	82.8	25.0 } 23.2	76.8 } 77.8
	F	55.9	44.8				
s-pns	M	22.8	25.1	} 24.1 47.6 } 48.1	37.6	10.2 } 10.9	78.6 } 76.5
	F	21.7	23.0				
s-ans	M	47.1	38.1	} 35.5 55.3 } 56.9	68.2	17.0 } 16.7	80.0 } 79.8
	F	46.4	32.9				
ba-pns	M	29.6	15.0	} 14.7 66.4 } 66.5	39.0	5.6 } 5.7	87.5 } 87.0
	F	28.5	14.3				
ba-ans	M	59.0	37.8	} 35.6 60.9 } 62.2	80.4	16.4 } 15.9	83.1 } 83.2
	F	57.7	33.4				

### 3.8 Discussion

As far as the author is aware, this is the first 3D-CT study to generate comprehensive reference data for craniofacial measurements in Malays. Indeed, normative craniofacial data for Malays in two dimensions are still lacking. The data collected from this study are best referred to as ‘references’ instead of ‘standards’ due to the nature of selecting the subjects in the study.

In many previous studies, so-called ‘standards’ of growth were presented separately for males and females due to significant differences observed between the two sexes (Riolo *et al.*, 1974; Costaras *et al.*, 1982; Farkas *et al.*, 1992a, 1992b; el-Batouti *et al.*, 1994; Johannsdottir *et al.*, 1999; Axelsson *et al.*, 2003). However, other investigators (Broadbent *et al.*, 1975; Waitzman *et al.*, 1992) have found no significant differences between the sexes or a difference in only some of the measurement variables. This disagreement between different studies may have resulted from differences in sample sizes, methods of subject selection, methods of measurements, landmarks used, regions studied or types of analyses carried out. In this study, a large number of subjects were included and all parameters relating to measurements were standardised as much as possible. Differences in size and growth trends between males and females within their age categories were observed. Therefore, results have been presented separately for males and females in the tables and graphs. Moreover, error studies performed showed that the errors of the method were within acceptable limits, i.e. 0.49mm which is basically the pixel size of the CT scans.

The author performed a cross-sectional rather than a longitudinal study for this project. Some of the reasons for this included the fact that cross-sectional standards are more representative of a “normal” population and enable comparisons of individuals with abnormalities. A cross-sectional approach was also selected because it would have been unethical to expose subjects unnecessarily to extra radiation by obtaining more than one CT

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scan. Nevertheless, it is acknowledged that longitudinal studies are particularly useful for determining the rate of growth and following individual subjects.

Results for this section are descriptive and summarised in the form of graphs and tables. Only descriptive statistics, such as mean values and standard deviations as well as minimum and maximum values, are presented. Following Farkas *et al.*, (1992), results are also presented as percentages of the mean values of the measurement in question at age 0 to 1 year and 3 to 5 years in relation to final adult values.

Measurement variables in all regions studied showed a rapid phase of growth in the first year of life and then significant growth up to the fifth year of life. This is apparent from the tables as the biggest size differences were noted during the first year. The graphs also gave an indication of periods of rapid growth during this time by exhibiting steep slopes.

Each region of the craniofacial complex studied displayed a unique growth pattern. Generally, the results indicated that the cranium grew rapidly in the first year of life. Growth slowed down in the later years and was almost complete by 5 years of age. The cranial vault approached adult size early in life, as has been documented in other studies (Waitzman *et al.*, 1992; Farkas *et al.*, 1992a). Most cranial vault and some cranial base variables achieved adult size by the age of 5 years as can be observed from the graphs in which the fitted lines levelled off by this age. The measurements collected indicate that by five years of age, the cranial structures have reached more than 90 percent of their eventual adult size. The exception to this was interporion width on the cranial vault which only exhibited 59% and 84% of its adult size at the ages of one and five years respectively. However, one can argue that this is not really a cranial vault measurement because the point *porion* was located on the most superior part of external auditory meatus.

A number of cranial base variables displayed evidence of growth well into adulthood as shown by the graphs that displayed a gradual increase in size after a period of rapid growth during the first three years. This was especially true for measurements involving the sphen-

occipital synchondrosis. This structure remains open until adolescence and becomes the site for bone deposition that is responsible for growth of the cranial base and related structures that attach to the cranial base. Spheno-occipital synchondrosis width reached between 75 to 80% of its adult size by five years of age, whereas its length measurement only achieved 70% of adult size by five years.

Anterior cranial base measurements in the mid-sagittal plane have been found to complete their growth earlier than those more posterior (Friede, 1981). In another study (Axelsson *et al.*, 2003), the anterior cranial base was observed to cease growing earlier than the posterior part in males only and not in females. In the present study, anterior cranial base measurements in mid-sagittal plane reached a greater proportion of adult size at the age of five years compared with posterior measurements. However, both graphs showed that the structures were still growing until adulthood.

Orbital structures have been reported to show differential growth patterns, with more growth in lateral directions than vertically (Enlow *et al.*, 1982). Measurements of orbital heights and lengths in the present study revealed that growth was almost complete by age five years, i.e. between 88 and 93 percent of adult size attained. With the exception of interorbital width, most other orbital width measurements kept on growing gradually until adulthood as evidenced in the graphs. Interorbital width exhibited small changes in its dimension from birth to adulthood. These findings were different from what has been observed in other studies (Sekiguchi *et al.*, 1973; Costaras *et al.*, 1982; Waizman *et al.*, 1992). These researchers have implied that growth levelled off by the age of 17 years in the cranium, orbit and upper face. However, in the present study, significant growth of the width of the orbit still appeared to occur beyond the age of 18 years, as also observed by Farkas *et al.* (1992c).

Contrasting observations were noted for nasal structures, where widths did not change much from birth to adulthood with more than 90 percent of adult size being attained at the age of 5 years. Nasal structures have been reported to change more in a vertical direction than

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laterally (Subtelny, 1959; Farkas *et al.*, 1992d) and a similar finding was noted in the present study. Nasal height and length only achieved 67 to 77 percent of adult size at the age of five years. The graphs show that nasal height and length measurements continue to grow gradually until adulthood after periods of rapid growth during the early years.

Maxillary and zygomatic variables showed patterns of rapid growth for the first 3 years followed by a period of gradual growth. The structures seemed to still increase in size beyond the age of 18 years but at a much slower rate. In contrast to the findings of the present study, growth of the maxilla in transverse dimensions was found to be completed at the age of 17 years in a longitudinal cephalometric study using implants (Bjork and Skieller, 1974). Other studies (Savara and Singh, 1968; Snodell *et al.*, 1993) have also reported that growth in maxillary width ceases by the age of 17 years. The difference in results may be due to the study designs used, i.e. longitudinal versus cross-sectional. However, in the studies referred to above measurements were only collected up to age 17 years with no information available beyond that age. In the present study, measurements were obtained of subjects up to age 25 years and some variables were found to show increase in size until adulthood, albeit at slower rate.

The mandible exhibited a similar pattern of growth changes as the maxilla and zygoma, with measurements continuing to increase beyond the age of 17 years. Generally, however, mandibular variables did not reach the same percentage of adult size as other variables by age five, percentages ranging from 70 to 80 %.

Another interesting pattern observed was that, at age five years, transverse dimensions for nasal, maxillary and mandibular regions had attained a greater percentage of adult size than corresponding vertical dimensions. In other words, these structures appear to grow more vertically than horizontally, a finding also supported by other researchers (Farkas *et al.*, 1992b; Snodell *et al.*, 1993).

Cranial base angle showed a trend of decreasing with age. Other studies (Thilander *et al.*, 1982; Axelsson *et al.*, 2003) have reported that this angle only experienced minor changes in females but decreased in males during their observation periods. Nasal angle values tended to increase with age which was expected as the nasal bone becomes more prominent in adults. Cephalic indices were found to be in the ranges of 82.0 to 86.0 for males and 84.0 to 87.0 for females, indicating that Malays fall into the brachycephalic to hyperbrachycephalic category of head form.

For most variables in all regions there were periods of increased size differences between certain age groups. The first period of increased size differences was observed to occur mostly between the age of 3 to 5 years and 5 to 10 years in females and between the age of 5 to 10 and 10 to 12 years in males. This event corresponds to the mid-growth spurt. Other periods that showed marked changes occurred between 10 to 12 and 12 to 14 years and also between 12 to 14 and 14 to 16 years in females. For boys, these events occurred between 12 to 14 and 14 to 16 years and also between 14 to 16 and 16 to 18 years. This observation probably reflects the period of the adolescent growth spurt. Some variables experienced “spurts” on two occasions. These findings are consistent with many other studies (Farkas *et al.*, 1992a, 1992b, 1992c, 1992d; Snodell *et al.*, 1993; Johannsdottir *et al.*, 1999; Axelsson *et al.*, 2003).

### **3.8.1 Clinical Implications**

The reference data collected and the growth information gained in this study are useful in many ways. The structures from different regions of the craniofacial complex experience differential growth patterns. Cranial vault and orbital regions reach most of their adult size by five years of age. This suggests to clinicians that any reconstructive bony surgery carried in this region after five years of age should be more or less stable, once healing has occurred.

The maxilla, zygoma and mandible are still growing beyond this age and some variables were associated with size changes well into adulthood. Unless functional concerns arise, clinicians may have to delay surgical intervention in these regions until after growth is complete. These results may also explain the frequent findings of recurrent exophthalmos during the treatment of Apert and Crouzon syndromes if total midface osteotomy with advancement is carried out early in life before the age of five years. This recurrence is not necessarily the result of skeletal relapse or poor technique but rather a reflection of the timing of surgery, carried out before the slowdown in skeletal growth. The timing of reconstruction should be based on the residual growth expected.

A preoperative quantitative CT scan analysis of a patient will permit the treating clinician to calculate preferred osteotomy movements to be achieved at operation. This practice is similar to preoperative cephalometric analysis and model surgery in operative surgical planning.

Reference data derived from CT scans can be used directly in the management of patients with craniofacial abnormalities. They may also be useful for projects such as three-dimensional computer-assisted surgical procedure designs (Cutting *et al.*, 1986; Vannier and Marsh, 1996).

Comparisons of norms developed from CT with those developed from cephalometry, cephalometric radiography and anthropometry are useful not only for research purposes but also to permit a multidisciplinary approach to the pre-surgical planning and post-surgical follow-up of patients.

### **3.9 Conclusion**

The purpose of this study was to create a normative database for the craniofacial complex using CT. These extensive normative reference data, specific for age categories and sexes, provide normal references for the description of craniofacial morphology in craniofacial abnormalities. Clinical applications of this quantitative approach to the craniofacial skeleton should establish their role in the management of craniofacial abnormalities. Additionally, each region of the craniofacial complex studied displayed a unique growth pattern. Moreover, the occurrence of increased size changes between specific ages for the craniofacial structures may indicate the timing of growth spurts.