**Supplementary Tables**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *Supplementary Table 1*  MtDNA data. A) Control region (CR), variable sites over 658 bp.  B) Cytochrome *b* (CYB), variable sites over 384 bp. C) Cytochrome oxidase I (COXI), variable sites over 987 bp. Gray shading highlights the nucleotide substitutions differentiating *M. hotaula* from *M. ginkgodens.* | | | | | | | | | | | | | | | | | | |
| A) CR | | | | | | | | | | | | | | | | | | |
| Specimens | 15 | 39 | 56 | 59 | 90 | 92 | 94 | 97 | 98 | 99 | 100 | 101 | 104 | 105 | 106 | 107 | 109 | 110 |
| *M. hotaula* |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 3WZS | G | G | A | A | C | T | C | G | C | A | T | A | T | A | C | C | A | C |
| UKIRI | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| USNM593418 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| USNM593414 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| USNM593426 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| MDV-X | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| *M. ginkgodens* |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| MginTSM8744 | . | A | G | . | A | C | T | A | T | G | C | G | C | G | T | \_ | G | T |
| MginTW01 | . | A | G | . | A | C | T | . | T | G | C | G | C | G | T | \_ | G | T |
| MginNZ03 | . | A | G | . | A | C | T | A | T | G | C | G | C | G | T | \_ | G | T |
| MginNZ04 | . | A | G | . | A | C | T | A | T | G | C | G | C | G | T | \_ | G | T |
| MginUSNM298237 | . | A | G | . | A | C | T | A | T | G | C | G | C | G | T | \_ | G | T |
| MginMV29623 | A | A | G | C | A | C | T | A | T | G | C | G | C | G | T | \_ | G | T |

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| (A) continued. |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Specimens | 111 | 113 | 133 | 147 | 148 | 249 | 251 | 279 | 318 | 352 | 363 | 405 | 407 | 439 | 500 | 522 | 599 |  |
| *M. hotaula* |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 3WZS | A | G | C | T | A | T | C | A | T | A | A | C | A | T | A | C | T |  |
| UKIRI | . | . | . | . | . | C | T | G | . | G | T | G | . | C | . | . | . |  |
| USNM593418 | . | . | . | . | . | C | T | G | . | G | T | G | . | C | . | . | . |  |
| USNM593414 | . | . | . | . | . | C | T | G | . | G | T | G | . | C | . | . | . |  |
| USNM593426 | . | . | . | . | . | C | T | G | . | G | T | G | . | C | . | . | . |  |
| MDV-X | . | . | . | . | . | C | T | G | . | . | T | G | . | . | G | T | . |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| *M. ginkgodens* |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| MginTSM8744 | G | . | T | C | G | . | . | G | . | G | T | G | . | ? | ? | ? | ? |  |
| MginTW01 | G | A | . | C | G | . | . | G | . | G | T | G | . | ? | ? | ? | ? |  |
| MginNZ03 | G | . | T | C | G | . | . | G | C | G | T | G | . | ? | ? | ? | ? |  |
| MginNZ04 | G | . | T | C | G | . | . | G | C | G | T | G | . | ? | ? | ? | ? |  |
| MginUSNM298237 | G | . | T | C | G | . | . | G | C | G | T | G | . | ? | ? | ? | ? |  |
| MginMV29623 | G | . | T | C | G | . | . | G | C | G | T | G | G | C | . | . | C |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| B) CYB | | | | | | | | | | | | | | | | |
| Specimens | 6 | 30 | 39 | 45 | 66 | 81 | 90 | 126 | 135 | 136 | 138 | 165 | 190 | 191 | 198 |  |
| *M. hotaula* |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| UKIRI | C | A | T | T | T | T | A | T | C | C | C | C | T | C | T |  |
| USNM593418 | . | . | . | . | . | . | . | C | . | . | . | . | . | . | . |  |
| USNM593426 | ? | ? | ? | ? | ? | ? | . | C | . | . | . | . | . | . | . |  |
| MM-0001 | ? | ? | ? | ? | ? | ? | . | C | . | . | . | . | . | . | . |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| *M. ginkgodens* |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| MginTW01 | T | G | C | C | C | C | G | C | T | A | T | T | C | T | . |  |
| MginNZ03 | T | . | C | C | C | C | . | C | T | A | T | T | C | T | C |  |
| MginNZ04 | T | . | C | C | C | C | . | C | T | A | T | T | C | T | C |  |
| MginMV29623 | ? | ? | ? | ? | ? | ? | ? | C | T | A | T | T | C | T | C |  |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| (B) continued. |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Specimens | 225 | 241 | 243 | 279 | 282 | 285 | 294 | 304 | 321 | 324 | 327 | 333 | 354 | 355 | 366 | 375 |
| *M. hotaula* |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| UKIRI | T | A | C | T | T | T | C | T | C | T | C | T | C | C | G | C |
| USNM593418 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| USNM593426 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . |
| MM-0001 | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | ? |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| *M. ginkgodens* |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| MginTW01 | C | T | . | C | C | C | T | C | T | C | T | A | T | T | A | T |
| MginNZ03 | C | T | T | C | C | C | T | C | T | C | T | A | T | T | A | T |
| MginNZ04 | C | T | . | C | C | C | T | C | T | C | T | A | T | T | A | T |
| MginMV29623 | C | T | . | C | C | C | T | C | T | C | T | A | T | T | A | T |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| C) COX I | | | | | | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Specimens | 5 | 20 | 27 | 33 | 71 | 86 | 95 | 96 | 98 | 114 | 119 | 143 | 173 | 206 | 219 | 236 | 242 | 269 | 285 | 293 | 299 | 359 |
| *M. hotaula* |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| UKIRI | C | T | T | C | C | C | A | T | A | C | T | A | C | C | T | T | A | C | C | C | T | A |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| *M. ginkgodens* |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| MginTW01 | T | . | C | T | . | . | G | C | G | T | C | . | T | A | C | . | C | T | T | . | A | G |
| MginNZ03 | T | C | C | T | . | T | G | C | G | T | C | G | T | A | C | C | . | T | T | T | A | . |
| MginNZ04 | T | C | C | T | T | T | G | C | G | T | C | . | T | A | C | C | . | T | T | T | A | . |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Specimens | 368 | 377 | 380 | 407 | 413 | 416 | 423 | 425 | 429 | 450 | 473 | 485 | 494 | 515 | 521 | 527 | 530 | 545 | 599 | 603 | 626 | 629 |
| *M. hotaula* |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| UKIRI | T | A | T | T | C | C | T | G | T | T | G | T | T | G | C | T | A | T | A | C | A | T |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| *M. ginkgodens* |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| MginTW01 | C | . | C | C | T | T | C | A | . | C | A | C | . | A | T | C | G | C | . | T | G | C |
| MginNZ03 | C | G | C | C | T | T | C | A | C | C | A | C | C | A | T | C | G | C | G | T | . | C |
| MginNZ04 | C | G | C | C | T | T | C | A | . | C | A | C | C | A | T | C | G | C | G | T | . | C |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| (C) continued. | | | | | | | | | | | | | | | | | | | | |
| Specimens | 662 | 689 | 713 | 717 | 731 | 752 | 779 | 788 | 806 | 815 | 821 | 822 | 833 | 860 | 872 | 875 | 887 | 917 | 920 | 953 |
| *M. hotaula* |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| UKIRI | T | T | A | T | A | T | T | A | A | T | C | T | T | C | T | T | T | T | T | G |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| *M. ginkgodens* |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| MginTW01 | C | C | G | C | G | C | C | G | G | C | T | C | C | T | . | C | C | C | C | . |
| MginNZ03 | C | C | G | C | G | C | C | G | G | C | T | C | C | T | C | C | C | C | C | A |
| MginNZ04 | C | C | G | C | G | C | C | G | G | C | T | C | C | T | C | C | C | C | C | A |

*Supplementary Table 2.* Pairwise net divergence between species, Kimura 2-parameter distances, as percentages, below diagonal. SE, above diagonal. Values for sister-species pairs highlighted in gray with bold type. (A) Control region, CR (435 bp); (B) cytochrome *b*, CYB (384 bp); (C) cytochrome oxidase I, COXI (958 bp). See footnotes of *Supplementary Table 2A* for translation of species codes.

(A) CR

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Mhot | Mgin | Mbi | Mbow | Mca | Mde | Meu | Mhe | Mlay | Mgr | Mmi | Mperu | Mpi | Mst | Mtr |
| Mhot |  | 0.910 | 1.030 | 1.110 | 0.970 | 1.080 | 1.050 | 0.830 | 1.060 | 1.300 | 1.020 | 1.070 | 1.050 | 1.130 | 1.180 |
| Mgin | **3.57** |  | 1.230 | 1.220 | 1.140 | 1.280 | 1.220 | 1.060 | 1.170 | 1.380 | 1.160 | 1.250 | 1.250 | 1.360 | 1.300 |
| Mbi | 4.40 | 5.89 |  | 1.130 | 1.060 | 1.260 | 0.860 | 1.010 | 1.080 | 1.180 | 1.000 | 1.100 | 1.180 | 1.140 | 1.140 |
| Mbow | 5.48 | 6.18 | 5.75 |  | 1.050 | 1.300 | 1.080 | 1.080 | 1.210 | 1.300 | 1.210 | 1.240 | 1.250 | 1.480 | 1.230 |
| Mca | 4.85 | 5.92 | 5.25 | **5.21** |  | 1.200 | 1.050 | 1.010 | 1.070 | 1.210 | 1.120 | 0.990 | 1.120 | 1.200 | 1.020 |
| Mde | 4.87 | 6.26 | 6.08 | 6.67 | 5.92 |  | 1.240 | 1.220 | 1.240 | 1.060 | 1.250 | 0.950 | 0.990 | 0.900 | 1.190 |
| Meu | 4.95 | 6.23 | 3.36 | 5.54 | 5.19 | 6.49 |  | 0.870 | 1.080 | 1.090 | 0.870 | 1.100 | 1.200 | 1.170 | 1.190 |
| Mhe | 3.11 | 4.50 | 4.25 | 5.22 | 4.85 | 5.91 | 3.32 |  | 0.950 | 1.120 | 0.960 | 1.110 | 1.170 | 1.060 | 1.130 |
| Mlay | 4.88 | 5.78 | 4.89 | 5.76 | 4.65 | 6.37 | 4.78 | 3.80 |  | 1.240 | 1.170 | 1.210 | 1.240 | 1.180 | 1.170 |
| Mgr | 6.22 | 7.20 | 5.84 | 6.80 | 6.13 | 4.86 | 5.59 | 5.05 | 6.50 |  | 1.160 | 0.950 | 1.070 | 1.170 | 1.400 |
| Mmi | 4.77 | 5.94 | 4.80 | 6.73 | 5.97 | 6.80 | **3.67** | 4.39 | 6.05 | 5.90 |  | 1.160 | 1.120 | 1.020 | 1.180 |
| Mperu | 4.90 | 6.25 | 5.31 | 6.43 | 4.33 | 3.75 | 5.59 | 5.43 | 6.21 | 3.92 | 6.15 |  | 0.830 | 0.960 | 1.210 |
| Mpi | 4.66 | 5.95 | 5.53 | 6.68 | 5.08 | 4.32 | 6.00 | 5.60 | 6.37 | 4.53 | 5.99 | **3.20** |  | 1.020 | 1.180 |
| Mst | 5.22 | 6.90 | 5.01 | 8.33 | 5.70 | **3.58** | 5.57 | 4.29 | 5.39 | 5.62 | 5.02 | 4.32 | 4.75 |  | 1.120 |
| Mtr | 5.72 | 6.67 | 5.50 | 6.41 | 4.47 | 6.17 | 5.90 | 5.08 | 5.67 | 8.06 | 6.27 | 6.39 | 6.10 | 5.48 |  |

Mhot, *M. hotaula*;Mgin, *M. ginkgodens*;Mbi, *M. bidens*;Mbow, *M. bowdoini*;Mca, *M. carlhubbsi*;Mde, *M. densirostris*;Meu, *M. europeaus*;Mhe, *M. hectori*;Mlay, *M. layardii*;Mgr, *M. grayi*;Mmi, *M. mirus*;Mperu, *M. peruvianus*;Mpi, *M. perrini*; Mst, *M. stejnegeri*; Mtr, *M. traversii.*

(B) CYB

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Mhot | Mgin | Mbi | Mbow | Mca | Mde | Meu | Mgr | Mhe | Mlay | Mmi | Mpi | Mperu | Mst | Mtr |
| Mhot |  | 1.790 | 2.290 | 2.300 | 2.010 | 2.110 | 1.900 | 2.060 | 2.300 | 1.890 | 1.330 | 2.310 | 2.330 | 2.220 | 2.310 |
| Mgin | **8.24** |  | 2.420 | 2.450 | 2.370 | 2.180 | 2.040 | 2.120 | 2.060 | 2.220 | 1.940 | 2.040 | 2.120 | 2.020 | 2.590 |
| Mbi | 12.19 | 13.86 |  | 2.250 | 2.160 | 2.050 | 2.480 | 2.400 | 2.110 | 2.380 | 1.650 | 2.610 | 2.210 | 1.940 | 2.040 |
| Mbow | 11.95 | 13.43 | 12.13 |  | 2.240 | 2.110 | 2.150 | 2.370 | 2.550 | 2.240 | 1.830 | 2.610 | 2.580 | 2.350 | 2.480 |
| Mca | 10.66 | 13.99 | 11.22 | **11.77** |  | 1.970 | 2.120 | 2.040 | 2.130 | 1.860 | 1.990 | 2.290 | 2.190 | 2.070 | 2.020 |
| Mde | 11.58 | 12.38 | 9.94 | 11.32 | 10.58 |  | 2.130 | 1.680 | 2.040 | 2.030 | 1.740 | 2.080 | 2.050 | 2.010 | 2.400 |
| Meu | 8.87 | 9.97 | 13.92 | 10.30 | 11.49 | 11.58 |  | 2.000 | 2.350 | 2.080 | 1.850 | 2.180 | 1.980 | 2.210 | 2.270 |
| Mgr | 10.59 | 11.72 | 12.37 | 12.48 | 10.48 | 7.39 | 10.15 |  | 2.150 | 2.130 | 1.830 | 1.950 | 1.810 | 1.920 | 2.430 |
| Mhe | 12.38 | 10.40 | 10.67 | 13.78 | 11.11 | 10.01 | 12.35 | 11.14 |  | 2.000 | 2.000 | 2.280 | 2.520 | 2.270 | 2.130 |
| Mlay | 9.49 | 12.47 | 12.62 | 11.85 | 8.82 | 10.41 | 10.72 | 10.78 | 9.87 |  | 1.420 | 2.280 | 2.220 | 2.470 | 2.280 |
| Mmi | 5.54 | 9.76 | 7.21 | 8.65 | 10.32 | 8.31 | **8.68** | 9.04 | 9.83 | 5.53 |  | 2.120 | 2.000 | 1.920 | 1.990 |
| Mpi | 13.75 | 10.88 | 15.54 | 16.13 | 13.55 | 11.15 | 12.58 | 10.17 | 12.47 | 13.28 | 11.61 |  | 2.240 | 2.080 | 2.720 |
| Mperu | 13.53 | 11.40 | 11.69 | 14.58 | 11.91 | 10.43 | 10.04 | 8.87 | 14.13 | 11.40 | 10.01 | **11.68** |  | 2.100 | 2.630 |
| Mst | 12.80 | 10.49 | 9.76 | 12.77 | 10.76 | **10.39** | 11.24 | 9.60 | 12.45 | 13.64 | 10.10 | 11.18 | 10.89 |  | 2.130 |
| Mtr | 12.77 | 13.85 | 10.95 | 13.25 | 10.32 | 13.65 | 12.43 | 13.42 | 11.03 | 12.52 | 10.26 | 16.60 | 15.71 | 11.41 |  |

(C) COXI

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Mhot | Mgin | Meu | Mmi | Mde |
| Mhot |  | 0.760 | 1.050 | 0.830 | 1.040 |
| Mgin | **5.52** |  | 0.930 | 0.950 | 1.040 |
| Meu | 9.36 | 8.03 |  | 0.900 | 1.100 |
| Mmi | 7.59 | 9.06 | **7.76** |  | 0.920 |
| Mde | 9.58 | 9.34 | 9.95 | 8.45 |  |

*Supplementary Table 3*. Y-chromosome intron, DBY7. Variable sites over 241 bp. The diagnostic nucleotide substitutions that distinguish *M. ginkgodens* and *M. hotaula* from each another, and from the other *Mesoplodon* species sampled are highlighted in gray.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Speciesa, b | 34 | 53 | 60 | 62 | 67 | 81 | 105 | 123 | 124 | 125 | 146 | 156 | 189 | 191 | 192 | 203 |
| *M. bowdoini* | G | C | G | T | T | A | C | \_ | \_ | \_ | C | G | C | C | C | T |
| *M. carlhubbsi* | . | . | . | . | . | . | . | \_ | \_ | \_ | . | . | . | . | . | . |
| *M. layardii* | . | . | . | . | . | . | A | \_ | \_ | \_ | . | . | . | . | . | . |
| *M. stejnegeri* | . | . | . | C | . | . | . | T | T | T | . | . | . | . | . | . |
| *M. grayi* | . | . | . | . | . | . | T | \_ | \_ | \_ | . | . | . | . | . | . |
| *M. perrini* | . | . | . | . | . | . | . | \_ | \_ | \_ | T | . | . | . | . | . |
| *M. hectori* | . | . | T | . | . | . | . | \_ | \_ | \_ | . | . | . | . | . | . |
| *M. europaeus* | . | T | . | . | . | G | . | \_ | \_ | \_ | . | . | . | . | . | . |
| *M. mirus* | . | . | . | . | . | . | . | \_ | \_ | \_ | . | . | . | . | . | . |
| *M. hotaula* | . | . | . | . | C | . | . | \_ | \_ | \_ | . | C | . | . | . | C |
| *M. ginkgodens* | . | . | . | . | C | . | . | \_ | \_ | \_ | . | . | . | T | . | C |
| *M. bidens* | A | . | . | . | . | . | . | \_ | \_ | \_ | . | . | . | . | . | . |
| aMissing *M. densirostris, M. peruvianus,* and *M. traversii.*  bGenBank Accession No’s: KF027328-KF027337. | | | | | | | | | | | | | | | | |

*Supplementary Table 4A.* Cranial measurements for *Mesoplodon hotaula.* Measurements (in mm) are taken on the right hand side (R) where possible, following Moore (1963). Where two measurements are given, R, then L. E, estimated length. See *Supplementary Table 3B* for definitions of measurements.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | 3WZS | USNM593418 | USNM593414 | USNM593426 | MDV-X |
|  | Deraniyagala (1963a), Anderson, this paper | Mead, this paper | Mead, this paper | Mead, this paper | Anderson, this paper |
| Measurement number | adult F | adult F | subadult F? | adult M | adult M |
| 1 | 735 | 680E | 615E | 735 | 721 |
| 2 |  | 604E | 528E | 678, 677 |  |
| 3 |  | 463E | 406E | 521 |  |
| 4 |  | 450E | 404E | 553, 550 |  |
| 5 |  | 516E | 462E | 606 |  |
| 6 |  | 620E, 612E | 581E, \_ | 695, 693 |  |
| 7 |  | 339E | 323E | 403 |  |
| 8 |  | 323 | 282 | 348 |  |
| 9 |  | 346 | 284 | 372 |  |
| 10 | 355 | 361E | 284 | 360 |  |
| 11 |  | 233 | \_ | 237 |  |
| 12 |  | 288 | 262 | \_ |  |
| 13 |  | 114 | 91 | 111 |  |
| 14 |  | 44 | 31 | 41, 47 |  |
| 15 |  | 71, 73 | 56, 56 | 70, 74 |  |
| 16 |  | 42 | 36 | 42 |  |
| 17 |  | 65 | 69 | 89 |  |
| 18 |  | 42 | 45 | 48 |  |
| 19 |  | 3 | -10 | 0 |  |
| 20 |  | 47 | 53 | 58 |  |
| 21 |  | 28 | \_ | 21 |  |
| 22 |  | 151 | 137 | 161 |  |
| 23 |  | 47 | 58 | 57 |  |
| 24 |  | 116 | 104 | 112 |  |
| 25 |  | 115 | 104 | 117 |  |
| 26 |  | 126E | 13 | 158 |  |
| 27 |  | 211 | 197 | 288 |  |
| 28 |  | 89 | \_ | 94 |  |
| 29 |  | 34 | 33 | 38 |  |
| 30 |  | 75 | 62 | 71 |  |
| 31 |  | \_ | \_ | 8 |  |
| 32 | 60.2 | 67 | 63 | 61 |  |
| 33 |  | 58 | 39 | 45 |  |
| 34 |  | 183 | 194 | 20 |  |
| 35 | 280 | 284 | 249 | 279 |  |
| 36 |  | 102, 100 | 104E | 103, 97 |  |
| 37 |  | 53, 54 | \_ | 55, 67 |  |
| 38 |  | 99, 94 | 82 | 87, 100 |  |
| 39 |  | 372E | 352E | 364 |  |
| 40 |  | 327E, 336E | 290, 290 | 411, 410 |  |
| 41 |  | 298E | 275 | 364 |  |
| 42 |  | 459E | \_ | 573 |  |
| 43 |  | \_ | \_ | 607 |  |
| 44 |  | \_ | \_ | 117 |  |
| 45 |  | 107 | \_ | 91 |  |
| 46 |  | 79 | 36 | 0 |  |
| Notes |  | skull extremely damaged, burned | incomplete skull | excellent skull, pathology on right lateral exo occipital (abcess) |  |

*Supplementary Table 4B*. Deﬁnitions of cranial measurements. Numbers in parentheses refer to Moore (1963).

1 – condylobasal length (1)

2 – tip rostrum to posterior extension maxillary plate (7)

3 – tip rostrum to anterior margin superior nares (8)

4 – tip rostrum to anterior point maxillary crest (9)

5 – tip rostrum to posterior extension premaxilla on lateral tip of right premaxillary crest (11)

6 – tip rostrum to posterior extension temporal fossa (10)

7 – tip rostrum to apices of antorbital notches (2)

8 – breadth skull across orbital centres (19)

9 – breadth skull across postorbital process frontals (17)

10 – breadth skull across zygomatic processes squamosals (18)

11 – least breadth skull across posterior margins temporal fossae (20)

12 – greatest breadth skull across ex-occipitals (25)

13 – greatest span occipital condyles (21)

14 – greatest width of an occipital condyle (22)

15 – greatest length of an occipital condyle (23)

16 – greatest breadth foramen magnum (24)

17 – greatest length of right nasal on vertex (15)

18 – length nasal suture (16)

19 – extension right premaxilla posterior to right nasal on vertex (28)

20 – greatest breadth nasals on vertex (26)

21 – least distance between anterior prominences of the synvertex (27)

22 – greatest span premaxillary crests (29)

23 – greatest transverse width of superior nares (37)

24 – least width premaxillae where narrow opposite superior nares (30)

25 – greatest width premaxillae anterior to position of previous (31)

26 – width rostrum in apices of antorbital notches (33)

27 – width rostrum in apices of prominential notches (34)

28 – least distance be- tween main maxillary foramina (41)

29 – least distance between premaxillary foramina (42)

30 – distance posterior margin of left maxillary foramina to anterior margin maxillary prominence (43)

31 – width rostrum at mid-length of rostrum (35)

32 – width premaxillae at mid-length of rostrum (32)

33 – depth rostrum at mid-length rostrum (36)

34 – height of skull (39)

35 – external cranial height

36 – greatest length of temporal fossa (13)

37 – width of temporal fossa (40)

38 – length of orbit taken from mid-point of frontals (14)

39 – tip rostrum to posterior extension of maxilla between pterygoids (6)

40 – tip rostrum to anterior extension of pterygoid sinus (12)

41 – tip rostrum to most anterior extension of pterygoids (5)

42 – tip rostrum to posterior margin of pterygoid mid-line (3)

43 – tip rostrum to posterior extension of wing of pterygoid (4)

44 – length of vomer visible at surface of palate (44)

45 – width between pterygoid notches (38)

46 – amount added to rostrum because of breakage (45)

*Supplementary Table 5A.* Mandibular measurements for *Mesoplodon hotaula*. Measurements (in mm) are taken on the right hand side (R) where possible, following Moore (1963). Where two measurements are given, R, then L. E, estimated length. See *Supplementary Table 4B* for definitions of measurements.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Measurement number | 3WZS | USNM593418 | USNM593426 | MDV-X |
|  | Deraniyagal (1963a) | Mead, this paper | Mead, this paper | Anderson, this paper |
|  | adult F | adult F | adult M | adult M |
| 47 | 631 | 618E | 620, 610 | 610, 615 |
| 48 |  | 491 | 493, 496 |  |
| 49 |  | 427 | 383, 377 |  |
| 50 |  | 137 | 139, 139 |  |
| 51 |  | 108 | 110, 114 |  |
| 52 |  | 49 | 88, 98 |  |
| 53 |  | 50, 49 | \_, 74 |  |
| 54 |  | 23, \_ | 89, 93 |  |
| 55 |  | 10, \_ | \_, 18 |  |
| 56 |  | 168, \_ | 168, 167 |  |
| 57 | 45 | 54 L | \_ | 88, 90 |
| 58 | 54 | 60 L | \_ | 57, 60 |
| 59 |  | 17 L | \_ |  |
| 60 |  | 20 L | \_ |  |
| 61 |  | 143 g L | \_ |  |
| 62 |  | 170 | 200 |  |
| Notes |  | mandible broken, left missing 170 mm | 200 mm added to mandibles due to breakage |  |

*Supplementary Table 5B*. Deﬁnitions of mandibular measurements. Numbers in parentheses refer to Moore (1963).

47 –mandibular length (1)

48 – length from posterior extension of symphysis to condyles (6)

49 – length posterior margin of alveolus to condyles (7)

50 – greatest length of symphysis (2)

51 – greatest height of mandible at coronoid processes (3)

52 – outside height of mandible at midlength of alveolus (4)

53 – inside height of mandible at midlength of alveolus (5)

54 – length of alveolus (8)

55 – width of alveolus (9)

56 – tip of mandible to alveolus (10)

57 – greatest tooth length (11)

58 – greatest tooth width (12)

59 – greatest tooth breadth (13)

60 – height of crown of tooth

61 – tooth weight

62 – amount added to mandibles due to breakage