**Table 1** Measured δ18O and δ13C values for sampled brachiopods; isotopic compositions are reported in per mil (‰) relative to VPDB. B denotes Left valve; P, right valve; W, whole shell samples; S, secondary layer material.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Specimen** | **Sample** **No.**  | **Valve** | **Layer** | **Depth (m)** | **δ13C ‰****(VPDB)** | **δ18O ‰** **(VPDB)** |
|  1 | 1Bap | B | W | -26 | 0.3 | 2.8 |
|  | 1Bbp | B | W | -26 | -0.6 | 1.8 |
|  | 1Bcp | B | W | -26 | 0.5 | 2.9 |
|  | 1Bdp | B | W | -26 | 0.7 | 3.2 |
|  | 1Bep | B | W | -26 | 1.1 | 3.0 |
|  | 1Bfp | B | W | -26 | 0.0 | 2.9 |
|  | 1Pas | P | S | -26 | 0.3 | 3.9 |
|  | 1Pbs | P | S | -26 | 0.3 | 3.7 |
|  | 1Pcs | P | S | -26 | 0.4 | 3.7 |
|  | 1Pds | P | S | -26 | 0.8 | 4.1 |
|  | 1Pes | P | S | -26 | 1.1 | 3.6 |
|  | 1Pfs | P | S | -26 | 1.5 | 4.1 |
| 2 | 2Bbp | B | W | -26 | 0.6 | 2.9 |
|  | 2Bcp | B | W | -26 | 0.5 | 2.8 |
|  | 2Bdp | B | W | -26 | 0.7 | 2.9 |
|  | 2Bep | B | W | -26 | 1.1 | 2.1 |
|  | 2Bfp | B | W | -26 | 1.2 | 3.5 |
|  | 2Pas | B | W | -26 | 0.8 | 3.9 |
|  | 2Pbs | P | S | -26 | 1.1 | 4.0 |
|  | 2Pcs | P | S | -26 | 1.2 | 3.8 |
|  | 2Pds | P | S | -26 | 1.5 | 4.3 |
|  | 2Pes | P | S | -26 | 1.6 | 4.2 |
|  | 2Pfs | P | S | -26 | 1.0 | 5.2 |
| 3 | 3Bap | B | W | -26 | 0.5 | 2.9 |
|  | 3Bbp | B | W | -26 | 0.3 | 3.0 |
|  | 3Bcp | B | W | -26 | -0.1 | 2.2 |
|  | 3Bdp | B | W | -26 | 0.5 | 2.9 |
| **Specimen** | **Sample** **No.**  | **Valve** | **Layer** | **Depth (m)** | **13C/12C****(VPDB)** | **18O/16O****(VPDB)** |
| 3 | 3Bep | B | W | -26 | 0.8 | 3.2 |
|  | 3Bfp | B | W | -26 | 0.8 | 3.3 |
|  | 3Pas | P | S | -26 | 1.0 | 4.0 |
|  | 3Pbs | P | S | -26 | 0.9 | 3.9 |
|  | 3Pcs | P | S | -26 | 1.0 | 4.1 |
|  | 3Pds | P | S | -26 | 1.1 | 4.0 |
|  | 3Pes | P | S | -26 | 1.3 | 4.1 |
|  | 3Pfs | P | S | -26 | 1.6 | 4.4 |
| 4 | 4Bap | B | W | -26 | 1.1 | 2.6 |
|  | 4Bbp | B | W | -26 | 0.9 | 2.7 |
|  | 4Bcp | B | W | -26 | 0.7 | 2.1 |
|  | 4Bdp | B | W | -26 | 0.3 | 3.0 |
|  | 4Bep | B | W | -26 | 0.4 | 3.0 |
|  | 4Bfp | B | W | -26 | -0.1 | 2.8 |
|  | 4Pas | P | S | -26 | 1.6 | 3.3 |
|  | 4Pbs | P | S | -26 | 1.7 | 3.3 |
|  | 4Pcs | P | S | -26 | 1.5 | 3.7 |
|  | 4Pds | P | S | -26 | 1.6 | 4.1 |
|  | 4Pes | P | S | -26 | 2.1 | 4.0 |
|  | 4Pfs | P | S | -26 | 0.9 | 4.7 |
| 5 | 5Bas | B | W | -26 | 0.9 | 3.5 |
|  | 5Bbs | B | W | -26 | 0.9 | 3.8 |
|  | 5Bcs | B | W | -26 | 1.1 | 3.2 |
|  | 5Bds | B | W | -26 | 1.4 | 3.8 |
|  | 5Bes | B | W | -26 | 1.4 | 3.6 |
|  | 5Bfs | P | S | -26 | 1.1 | 4.1 |
|  | 5Pap | P | S | -26 | 0.5 | 3.4 |
|  | 5Pbp | P | S | -26 | 0.8 | 3.4 |
|  | 5Pcp | P | S | -26 | 0.6 | 3.6 |
|  | 5Pdp | P | S | -26 | 1.0 | 3.2 |
| **Specimen** | **Sample** **No.**  | **Valve** | **Layer** | **Depth (m)** | **13C/12C****(VPDB)** | **18O/16O****(VPDB)** |
| 5 | 5Pep | P | S | -26 | 1.0 | 3.8 |
|  | 5Pfp | P | S | -26 | 0.9 | 4.0 |
| 6 | 6Bas | B | W | -26 | 1.0 | 3.9 |
|  | 6Bbs | B | W | -26 | 0.7 | 3.7 |
|  | 6Bcs | B | W | -26 | 1.0 | 3.7 |
|  | 6Bds | B | W | -26 | 1.2 | 3.8 |
|  | 6Bes | B | W | -26 | 1.2 | 3.4 |
|  | 6Bfs | B | W | -26 | 1.5 | 3.5 |
|  | 6Pap | P | S | -26 | 0.7 | 3.4 |
|  | 6Pbp | P | S | -26 | 0.9 | 3.3 |
|  | 6Pcp | P | S | -26 | 1.2 | 3.3 |
|  | 6Pdp | P | S | -26 | 1.1 | 3.5 |
|  | 6Pep | P | S | -26 | 1.4 | 3.7 |
|  | 6Pfp | P | S | -26 | 1.9 | 3.8 |
| 7 | 7Bas | B | W | -26 | 0.8 | 3.6 |
|  | 7Bbs | B | W | -26 | 1.2 | 3.4 |
|  | 7Bcs | B | W | -26 | 1.3 | 3.5 |
|  | 7Bds | B | W | -26 | 1.2 | 3.6 |
|  | 7Bes | B | W | -26 | 1.4 | 3.5 |
|  | 7Bfs | B | W | -26 | 1.2 | 3.6 |
|  | 7Pap | P | S | -26 | 0.8 | 3.4 |
|  | 7Pbp | P | S | -26 | 0.9 | 3.7 |
|  | 7Pcp | P | S | -26 | 1.3 | 3.2 |
|  | 7Pdp | P | S | -26 | 1.5 | 3.4 |
|  | 7Pep | P | S | -26 | 1.4 | 4.0 |
|  | 7Pfp | P | S | -26 | 1.0 | 4.3 |
|  |

Table 2 Geochemical data for brachiopod specimens, data are in mg/kg (ppm) or as stated. B denotes left valve; P, right valve.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Specimen** | **Sample** | **Valve** | **Ca** | **Mg** | **Na** | **Sr** | **Zn** | **Mn** | **Fe** | **Al** | **Cd** | **Ba** | **B (ppb)** | **Cr (ppb)** | **Pb (ppb)** |
| 1 | A1b | B | 385046 | 4396 | 6173 | 1245 | 46 | 21 | 15 | 17 | 6 | 3 | 3377 | 609 | 573 |
|  | P1b | B | 386953 | 4365 | 4833 | 1231 | 44 | 18 | 18 | 10 | 7 | 5 | 2764 | 106 | 1070 |
|  | A1p | P | 339996 | 4764 | 4120 | 1058 | 48 | 24 | 10 | 14 | 8 | 6 | 2342 | 590 | 752 |
|  | P1p | P | 363026 | 3566 | 3741 | 1188 | 22 | 14 | 8 | 6 | 4 | 6 | 2504 | 590 | 562 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 2 | A2b | B | 379736 | 5004 | 4654 | 1242 | 37 | 18 | 8 | 7 | 7 | 3 | 244 | 176 | 1005 |
|  | P2b | B | 371218 | 5890 | 3762 | 1213 | 26 | 16 | 12 | 5 | 6 | 4 | 280 | 216 | 1164 |
|  | A2p | P | 376455 | 5430 | 4466 | 1327 | 41 | 18 | 9 | 11 | 7 | 6 | 934 | 300 | 859 |
|  | P2p | P | 353701 | 6279 | 3360 | 1189 | 26 | 16 | 6 | 7 | 6 | 4 | 2152 | 119 | 901 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 3 | A3b | B | 383642 | 5442 | 4856 | 1304 | 26 | 28 | 32 | 4 | 6 | 4 | 784 | 67 | 996 |
|  | P3b | B | 356138 | 5816 | 3249 | 1147 | 20 | 24 | 20 | 5 | 6 | 5 | DL | DL | 944 |
|  | A3p | P | 362436 | 5325 | 4153 | 1275 | 25 | 26 | 14 | 6 | 6 | 5 | 1126 | 153 | 855 |
|  | P3p | P | 377946 | 6793 | 3232 | 1189 | 24 | 28 | 37 | 7 | 6 | 5 | 704 | 746 | 1154 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 4 | A4b | B | 460695 | 7798 | 5620 | 1639 | 35 | 33 | 36 | 59 | 8 | 9 | 1159 | 1108 | 1569 |
|  | P4b | B | 384402 | 7935 | 3590 | 1330 | 28 | 31 | 21 | 5 | 8 | 12 | 296 | 377 | 1414 |
|  | A4p | P | 397755 | 6694 | 5192 | 1413 | 31 | 36 | 19 | 5 | 9 | 11 | DL | 356 | 1360 |
|  | P4p | P | 399049 | 8884 | 4209 | 1456 | 31 | 36 | 19 | 5 | 9 | 11 | 530 | 849 | 1261 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 5 | A5b | B | 388256 | 7015 | 4616 | 1439 | 39 | 22 | 15 | 6 | 8 | 7 | 138 | 102 | 1402 |
|  | P5b | B | 402120 | 9402 | 4345 | 1498 | 45 | 26 | 17 | 16 | 10 | 7 | DL | 337 | 1701 |
|  | A5p | P | 392656 | 8352 | 5447 | 1693 | 42 | 25 | 14 | 7 | 9 | 10 | 228 | 366 | 1853 |
|  | P5p | P | 396320 | 10476 | 4776 | 1546 | 40 | 26 | 17 | 7 | 9 | 6 | 344 | 89 | 1939 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 6 | A6b | B | 431247 | 7426 | 4713 | 1551 | 40 | 38 | 37 | 7 | 11 | 10 | DL | 162 | 1912 |
|  | P6b | B | 365690 | 6362 | 4277 | 1229 | 23 | 29 | 19 | 4 | 7 | 6 | 368 | 97 | 1695 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Specimen** | **Sample** | **Valve** | **Ca** | **Mg** | **Na** | **Sr** | **Zn** | **Mn** | **Fe** | **Al** | **Cd** | **Ba** | **B (ppb)** | **Cr (ppb)** | **Pb (ppb)** |
| 6 | A6p | P | 411798 | 6989 | 4161 | 1509 | 35 | 35 | 27 | 6 | 10 | 6 | 928 | 217 | 1041 |
|  | P6p | P | 416584 | 7394 | 4121 | 1462 | 19 | 25 | 14 | 3 | 6 | 6 | 583 | 695 | 933 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 7 | A7b | B | 399640 | 5898 | 4283 | 1350 | 29 | 29 | 22 | 5 | 8 | 7 | DL | 75 | 1481 |
|  | P7b | B | 370502 | 7282 | 4679 | 1186 | 22 | 29 | 19 | 4 | 7 | 7 | 344 | 93 | 1475 |
|  | A7p | P | 361926 | 5602 | 5280 | 1250 | 31 | 31 | 21 | 3 | 8 | 5 | 638 | 225 | 1087 |
|  | P7p | P | 371748 | 5884 | 3450 | 1093 | 15 | 22 | 12 | 1 | 5 | 4 | 824 | 73 | 783 |