**Supplementary file 3** **Posterior probability statistics for ancestral sequence reconstruction of AncA0 and AncA1 nodes:** For each position amino acids reconstructed with posterior probability higher than 0.2 are shown. Single – letter symbols of reconstructed amino acids are followed by posterior probability of reconstruction (in brackets). Positions at which most likely amino acid differ between AncA0 and AncA1 are marked in bold and italics. Posterior probabilities estimated using FastML program based on Maximum Likelihood and Empirical Bayes method.

|  |  |
| --- | --- |
| Position Number | Posterior probabilities |
| **AncA0** | **AncA1** |
| 1 | M (0.999926) | M (0.999866) |
| 2 | R (0.999613) | R (0.999411) |
| 3 | N (0.999721) | N (0.999542) |
| 4 | F (0.999497) | F (0.999873) |
| 5 | D (0.999313) | D (0.999001) |
| 6 | L (0.999064) | L (0.999692) |
| 7 | S (0.998966) | S (0.997905) |
| 8 | P (0.99996) | P (0.999935) |
| 9 | L (0.999823) | L (0.999728) |
| 10 | Y (0.999937) | Y (0.999902) |
| 11 | R (0.999613) | R (0.999411) |
| 12 | S (0.999127) | S (0.998633) |
| 13 | A (0.999325) | A (0.99838) |
| 14 | I (0.998482) | I (0.997912) |
| 15 | G (0.999955) | G (0.999926) |
| 16 | F (0.999931) | F (0.99989) |
| 17 | D (0.999313) | D (0.999001) |
| 18 | R (0.999613) | R (0.999411) |
| 19 | L (0.999823) | L (0.999728) |
| 20 | F (0.999754) | F (0.97628) |
| 21 | N (0.999721) | N (0.999542) |
| 22 | L (0.999812) | L (0.999727) |
| 23 | L (0.9998) | L (0.999727) |
| 24 | E (0.999305) | E (0.999025) |
| 25 | S (0.961991) | S (0.995727) |
| 26 | N (0.988107) | N (0.999069) |
| 27 | Q (0.999869) | Q (0.999782) |
| 28 | N (0.620376) S (0.354683) | N (0.671642) |
| 29 | Q (0.999869) | Q (0.999779) |
| 30 | S (0.999045) | S (0.998513) |
| 31 | N (0.999721) | N (0.999542) |
| 32 | G (0.999955) | G (0.999926) |
| 33 | G (0.999955) | G (0.999926) |
| 34 | Y (0.999937) | Y (0.999902) |
| 35 | P (0.99996) | P (0.999935) |
| 36 | P (0.99996) | P (0.999935) |
| 37 | Y (0.999937) | Y (0.999902) |
| 38 | N (0.999721) | N (0.999542) |
| 39 | V (0.998095) | V (0.997517) |
| 40 | E (0.999305) | E (0.999025) |
| 41 | L (0.999823) | L (0.999728) |
| 42 | V (0.998095) | V (0.997517) |
| 43 | D (0.999279) | D (0.998143) |
| 44 | E (0.999129) | E (0.999009) |
| 45 | N (0.999721) | N (0.999542) |
| 46 | H (0.999623) | H (0.999857) |
| 47 | Y (0.999937) | Y (0.999902) |
| 48 | R (0.999613) | R (0.999411) |
| 49 | I (0.998482) | I (0.997912) |
| 50 | ***A (0.986377)*** | ***T (0.983415)*** |
| 51 | I (0.998482) | I (0.997911) |
| 52 | A (0.999353) | A (0.999) |
| 53 | V (0.998095) | V (0.997517) |
| 54 | A (0.999353) | A (0.999) |
| 55 | G (0.999955) | G (0.999926) |
| 56 | F (0.999931) | F (0.99989) |
| 57 | A (0.999353) | A (0.998999) |
| 58 | ***E (0.993163)*** | ***Q (0.991222)*** |
| 59 | S (0.980818) | S (0.993494) |
| 60 | E (0.999305) | E (0.999025) |
| 61 | L (0.999823) | L (0.999728) |
| 62 | D (0.94017) | D (0.991033) |
| 63 | I (0.998482) | I (0.997912) |
| 64 | T (0.999463) | T (0.999145) |
| 65 | ***A (0.976453)*** | ***S (0.978346)*** |
| 66 | ***Q (0.703474) H (0.296138)*** | ***H (0.994492)*** |
| 67 | D (0.999258) | D (0.998997) |
| 68 | N (0.999721) | N (0.999542) |
| 69 | L (0.999261) | L (0.981563) |
| 70 | L (0.999823) | L (0.999728) |
| 71 | I (0.997518) | I (0.997483) |
| 72 | V (0.998094) | V (0.997516) |
| 73 | ***K (0.940376)*** | ***R (0.984241)*** |
| 74 | G (0.999955) | G (0.999926) |
| 75 | A (0.998624) | A (0.998938) |
| 76 | H (0.999878) | H (0.999865) |
| 77 | A (0.997391) | A (0.889298) |
| 78 | ***G (0.977685)*** | ***E (0.991155)*** |
| 79 | E (0.999217) | E (0.999017) |
| 80 | Q (0.99967) | Q (0.999775) |
| 81 | P (0.752893) | P (0.8025) |
| 82 | E (0.998753) | E (0.998985) |
| 83 | R (0.999607) | R (0.999292) |
| 84 | T (0.987703) | T (0.804431) |
| 85 | Y (0.999937) | Y (0.999902) |
| 86 | L (0.999823) | L (0.999728) |
| 87 | Y (0.999937) | Y (0.999902) |
| 88 | Q (0.999869) | Q (0.999782) |
| 89 | G (0.999955) | G (0.999926) |
| 90 | I (0.998482) | I (0.997912) |
| 91 | A (0.999353) | A (0.999) |
| 92 | E (0.999305) | E (0.999025) |
| 93 | R (0.999613) | R (0.999411) |
| 94 | N (0.999721) | N (0.999542) |
| 95 | F (0.999931) | F (0.99989) |
| 96 | E (0.999305) | E (0.999025) |
| 97 | R (0.999613) | R (0.999411) |
| 98 | K (0.999614) | K (0.99943) |
| 99 | F (0.999931) | F (0.99989) |
| 100 | Q (0.999869) | Q (0.999782) |
| 101 | L (0.999823) | L (0.999728) |
| 102 | A (0.999353) | A (0.999) |
| 103 | E (0.998666) | E (0.98408) |
| 104 | H (0.984462) | H (0.999627) |
| 105 | I (0.991805) | I (0.840342) |
| 106 | H (0.979793) | H (0.990368) |
| 107 | V (0.989116) | V (0.996634) |
| 108 | R (0.968539) | R (0.997839) |
| 109 | ***G (0.99667)*** | ***D (0.991238)*** |
| 110 | A (0.999353) | A (0.999) |
| 111 | ***N (0.99357)*** | ***R (0.988165)*** |
| 112 | L (0.999823) | L (0.999728) |
| 113 | E (0.987968) | E (0.998552) |
| 114 | N (0.999721) | N (0.999542) |
| 115 | G (0.999955) | G (0.999926) |
| 116 | L (0.999823) | L (0.999728) |
| 117 | L (0.999823) | L (0.999728) |
| 118 | Y (0.999936) | Y (0.999865) |
| 119 | I (0.998472) | I (0.997904) |
| 120 | D (0.999116) | D (0.998989) |
| 121 | L (0.999751) | L (0.999724) |
| 122 | E (0.999305) | E (0.999025) |
| 123 | R (0.999613) | R (0.999411) |
| 124 | V (0.770855) I (0.228497) | V (0.794577) I (0.204744) |
| 125 | V (0.904419) | V (0.990099) |
| 126 | P (0.99996) | P (0.999935) |
| 127 | E (0.999305) | E (0.999025) |
| 128 | A (0.988944) | A (0.985575) |
| 129 | M (0.999359) | M (0.999806) |
| 130 | K (0.99958) | K (0.999428) |
| 131 | P (0.99996) | P (0.999935) |
| 132 | R (0.999613) | R (0.999411) |
| 133 | R (0.999523) | R (0.999404) |
| 134 | I (0.998482) | I (0.997912) |
| 135 | E (0.999209) | E (0.997485) |
| 136 | I (0.998482) | I (0.997912) |
| 137 | ***N (0.511055) K (0.449598)*** | ***L (0.988567)*** |
| 138 | ***-*** | ***K (0.619166) S (0.322748)*** |