Extent of amino acid racemization (D/L) in all subsamples

3 % H2O2 soak = 2 hours, leach = no, bleach = no, grind = no, sonicate = yes, save sample = no, hydrolysis time = 6 hours

Rejection criteria:

Red = L-Ser/L-Asp > 0.8

Green = non-covarying DL Asp and DL Glu

Blue = DL Asp or Glu not within ± 2σ of the mean

Grey = Subsample destroyed

n = number of tests

UAL	Core	Depth (mbsf)	Species	n	DL Asp	DL Glu	DL Ser	L Ser / L Asp
15544A	PS92/39-2	0.2	*N. pachyderma*	10	0.095	0.027	0.038	1.6
15544B	PS92/39-2	0.2	*N. pachyderma*	10	0.053	0.024	0.018	2.2
15544C	PS92/39-2	0.2	*N. pachyderma*	10	0.094	0.033	0.041	1.2
15544D	PS92/39-2	0.2	*N. pachyderma*	10	0.121	0.056	0.063	0.8
15544E	PS92/39-2	0.2	*N. pachyderma*	10	0.041	0.018	0.006	1.9
15544F	PS92/39-2	0.2	*N. pachyderma*	10	0.068	0.029	0.029	1.2
15544G	PS92/39-2	0.2	*N. pachyderma*	10				
15545A	PS92/39-2	0.35	*N. pachyderma*	9	0.049	0.023	0.013	1.7
15545B	PS92/39-2	0.35	*N. pachyderma*	10	0.063	0.024	0.021	1.5
15545C	PS92/39-2	0.35	*N. pachyderma*	10	0.056	0.021	0.009	1.5
15545D	PS92/39-2	0.35	*N. pachyderma*	10	0.055	0.028	0.022	1.6
15546A	PS92/39-2	1.50	*N. pachyderma*	10	0.244	0.089	0.325	0.5
15546B	PS92/39-2	1.50	*N. pachyderma*	10	0.247	0.092	0.347	0.5
15546C	PS92/39-2	1.50	*N. pachyderma*	10				
15546D	PS92/39-2	1.50	*N. pachyderma*	10	0.237	0.076	0.275	0.5
15546E	PS92/39-2	1.50	*N. pachyderma*	10	0.208	0.071	0.226	0.6
15546F	PS92/39-2	1.50	*N. pachyderma*	10				
15546G	PS92/39-2	1.50	*N. pachyderma*	10	0.079	0.024	0.023	1.6
15547A	PS92/39-2	3.00	*N. pachyderma*	10	0.222	0.087	0.209	0.6
15547B	PS92/39-2	3.00	*N. pachyderma*	10	0.250	0.108	0.258	0.5
15547C	PS92/39-2	3.00	*N. pachyderma*	10	0.274	0.126	0.424	0.4
15547D	PS92/39-2	3.00	*N. pachyderma*	10	0.282	0.124	0.248	0.6
15547E	PS92/39-2	3.00	*N. pachyderma*	10	0.282	0.121	0.324	0.5
15547F	PS92/39-2	3.00	*N. pachyderma*	10	0.282	0.104	0.256	0.6
15547G	PS92/39-2	3.00	*N. pachyderma*	10	0.243	0.066	0.169	0.2
15547H	PS92/39-2	3.00	*N. pachyderma*	10	0.231	0.085	0.180	0.8
15548A	PS92/39-2	3.81	*N. pachyderma*	10	0.243	0.094	0.244	0.4
15548B	PS92/39-2	3.81	*N. pachyderma*	10	0.239	0.087	0.241	0.4
15548C	PS92/39-2	3.81	*N. pachyderma*	10	0.256	0.127	0.325	0.3
15548D	PS92/39-2	3.81		10				
15548E	PS92/39-2	3.81	*N. pachyderma*	10	0.208	0.074	0.127	0.8
15548F	PS92/39-2	3.81	*N. pachyderma*	10	0.245	0.099	0.289	0.4
15548G	PS92/39-2	3.81	*N. pachyderma*	10	0.212	0.086	0.252	0.2
15548H	PS92/39-2	3.81	*N. pachyderma*	10	0.068	0.027	0.018	1.4
15548I	PS92/39-2	3.81	*N. pachyderma*	10	0.232	0.100	0.236	0.5
15548J	PS92/39-2	3.81	*N. pachyderma*	7	0.229	0.092	0.215	0.5
15549A	PS92/39-2	5.82	*N. pachyderma*	10	0.163	0.053	0.090	0.9
15549B	PS92/39-2	5.82	*N. pachyderma*	10	0.194	0.071	0.105	0.7
15549C	PS92/39-2	5.82	*N. pachyderma*	10	0.249	0.097	0.143	0.8
15549D	PS92/39-2	5.82	*N. pachyderma*	10	0.331	0.152	0.364	0.5
15549E	PS92/39-2	5.82	*N. pachyderma*	10	0.211	0.070	0.099	1.0
15549F	PS92/39-2	5.82	*N. pachyderma*	10	0.225	0.082	0.137	0.9
15549G	PS92/39-2	5.82	*N. pachyderma*	10	0.313	0.121	0.203	0.6
15549H	PS92/39-2	5.82	*N. pachyderma*	10	0.069	0.026	0.019	1.5
15549I	PS92/39-2	5.82	*N. pachyderma*	10	0.038	0.018	0.006	1.9
15550A	PS92/39-2	6.52	*N. pachyderma*	10	0.307	0.139	0.309	0.3
15550B	PS92/39-2	6.52	*N. pachyderma*	10	0.338	0.176	0.421	0.3
15550C	PS92/39-2	6.52	*N. pachyderma*	10	0.309	0.151	0.282	0.4
15550D	PS92/39-2	6.52	*N. pachyderma*	10	0.331	0.166	0.429	0.3
15550E	PS92/39-2	6.52	*N. pachyderma*	10	0.339	0.117	0.215	0.4
15550F	PS92/39-2	6.52	*N. pachyderma*	10	0.310	0.161	0.395	0.2
15550G	PS92/39-2	6.52	*N. pachyderma*	10	0.310	0.156	0.340	0.3
15550H	PS92/39-2	6.52	*N. pachyderma*	10	0.297	0.137	0.154	0.5
15550I	PS92/39-2	6.52	*N. pachyderma*	10	0.299	0.133	0.173	0.7
15551B	PS92/39-2	7.22	*N. pachyderma*	10	0.288	0.108	0.145	0.6
15551F	PS92/39-2	7.22	*N. pachyderma*	10	0.317	0.136	0.252	0.5
15551G	PS92/39-2	7.22	*N. pachyderma*	10	0.304	0.128	0.208	0.5
15551E	PS92/39-2	7.22	*N. pachyderma*	10	0.251	0.081	0.091	0.9
15551D	PS92/39-2	7.22	*N. pachyderma*	10	0.282	0.101	0.118	0.8
15551J	PS92/39-2	7.22	*N. pachyderma*	5	0.272	0.076	0.072	1.4
15551C	PS92/39-2	7.22	*N. pachyderma*	10				
15551A	PS92/39-2	7.22	*N. pachyderma*	10				
15551H	PS92/39-2	7.22	*N. pachyderma*	10				

15551I	PS92/39-2	7.22	*N. pachyderma*	10				
15552A	PS92/39-2	8.32	*N. pachyderma*	10	0.274	0.106	0.139	0.6
15552B	PS92/39-2	8.32	*N. pachyderma*	10	0.210	0.075	0.081	1.1
15552C	PS92/39-2	8.32	*N. pachyderma*	10	0.255	0.079	0.071	1.6
15552D	PS92/39-2	8.32	*N. pachyderma*	10	0.190	0.081	0.077	1.2
15552E	PS92/39-2	8.32	*N. pachyderma*	10	0.295	0.104	0.118	0.9
15552F	PS92/39-2	8.32	*N. pachyderma*	10	0.315	0.135	0.197	0.6
15552G	PS92/39-2	8.32	*N. pachyderma*	10	0.292	0.114	0.152	0.7
15552H	PS92/39-2	8.32	*N. pachyderma*	10	0.271	0.100	0.127	0.7
15552I	PS92/39-2	8.32	*N. pachyderma*	9.5	0.262	0.100	0.120	0.8
15552J	PS92/39-2	8.32	*N. pachyderma*	13	0.215	0.074	0.074	1.0
15553A	PS92/39-2	8.42	*N. pachyderma*	7	0.338	0.120	0.226	0.5
15553B	PS92/39-2	8.42	*N. pachyderma*	10				
15553C	PS92/39-2	8.42	*N. pachyderma*	10	0.327	0.175	0.258	0.4
15553D	PS92/39-2	8.42	*N. pachyderma*	10				
15553E	PS92/39-2	8.42	*N. pachyderma*	10	0.327	0.177	0.374	0.3
15553F	PS92/39-2	8.42	*N. pachyderma*	10	0.358	0.184	0.344	0.4
15553G	PS92/39-2	8.42	*N. pachyderma*	10	0.336	0.172	0.365	0.3
15553H	PS92/39-2	8.42	*N. pachyderma*	10	0.310	0.150	0.274	0.5
15553I	PS92/39-2	8.42	*N. pachyderma*	10	0.313	0.159	0.363	0.3
15553J	PS92/39-2	8.42	*N. pachyderma*	5				
17315A	PS92/45-2	1.04	C. neoteretis	7	0.121	0.034	0.147	0.4
17315B	PS92/45-2	1.04	C. neoteretis	7	0.119	0.034	0.113	0.6
17315C	PS92/45-2	1.04	C. neoteretis	7	0.125	0.034	0.141	0.4
17315D	PS92/45-2	1.04	C. neoteretis	7	0.100	0.025	0.054	0.9
17315E	PS92/45-2	1.04	C. neoteretis	7	0.118	0.034	0.109	0.5
17315F	PS92/45-2	1.04	C. neoteretis	7	0.125	0.038	0.130	0.5
17315G	PS92/45-2	1.04	C. neoteretis	7	0.120	0.034	0.116	0.5
17316A	PS92/45-2	1.39	C. neoteretis	7	0.139	0.047	0.084	0.9
17316B	PS92/45-2	1.39	C. neoteretis	7	0.159	0.055	0.164	0.5
17317A	PS92/45-2	1.59	C. neoteretis	7	0.175	0.061	0.187	0.6
17317B	PS92/45-2	1.59	C. neoteretis	7	0.183	0.061	0.132	0.7
17317C	PS92/45-2	1.59	C. neoteretis	7	0.156	0.046	0.144	0.6
17317D	PS92/45-2	1.59	C. neoteretis	7	0.160	0.051	0.174	0.5
17317E	PS92/45-2	1.59	C. neoteretis	7	0.167	0.057	0.205	0.5
17317F	PS92/45-2	1.59	C. neoteretis	7	0.162	0.053	0.197	0.5
17317G	PS92/45-2	1.59	C. neoteretis	7	0.204	0.081	0.240	0.5
17318A	PS92/45-2	1.75	C. neoteretis	7	0.134	0.043	0.059	1.1
17318D	PS92/45-2	1.75	C. neoteretis	7	0.091	0.026	0.031	1.7
17318F	PS92/45-2	1.75	C. neoteretis	7	0.189	0.070	0.130	0.6
17319A	PS92/45-2	3.12	C. neoteretis	10	0.260	0.104	0.169	0.6
17319B	PS92/45-2	3.12	C. neoteretis	10	0.310	0.114	0.214	0.5
17319C	PS92/45-2	3.12	C. neoteretis	10	0.287	0.107	0.240	0.5
17319D	PS92/45-2	3.12	C. neoteretis	10	0.253	0.095	0.205	0.5
17319E	PS92/45-2	3.12	C. neoteretis	10	0.266	0.096	0.198	0.5
17319F	PS92/45-2	3.12	C. neoteretis	10	0.341	0.139	0.341	0.4
17319G	PS92/45-2	3.12	C. neoteretis	10	0.269	0.105	0.179	0.6
17319H	PS92/45-2	3.12	C. neoteretis	6	0.265	0.091	0.149	1.3
17320A	PS92/45-2	4.17	C. neoteretis	7	0.366	0.183	0.263	0.5
17320B	PS92/45-2	4.17	C. neoteretis	7	0.336	0.162	0.215	0.5
17320C	PS92/45-2	4.17	C. neoteretis	7	0.328	0.155	0.229	0.5
17320D	PS92/45-2	4.17	C. neoteretis	7	0.334	0.141	0.197	0.5
17320E	PS92/45-2	4.17	C. neoteretis	7	0.237	0.098	0.103	1.8
17320F	PS92/45-2	4.17	C. neoteretis	7	0.413	0.212	0.342	0.4
17320G	PS92/45-2	4.17	C. neoteretis	6	0.988	0.127	0.905	0.7
17321A	PS92/45-2	4.45	C. neoteretis	10	0.288	0.167	0.196	0.5
17321B	PS92/45-2	4.45	C. neoteretis	10	0.282	0.153	0.194	0.5
17321C	PS92/45-2	4.45	C. neoteretis	10	0.253	0.130	0.116	0.9
17321D	PS92/45-2	4.45	C. neoteretis	10	0.254	0.124	0.149	0.7
17321E	PS92/45-2	4.45	C. neoteretis	10	0.232	0.101	0.121	0.9
17321F	PS92/45-2	4.45	C. neoteretis	10	0.248	0.132	0.146	0.6
17321G	PS92/45-2	4.45	C. neoteretis	10	0.268	0.142	0.207	0.5
17321H	PS92/45-2	4.45	C. neoteretis	10	0.401	0.383	0.429	0.5
17321I	PS92/45-2	4.45	C. neoteretis	10	0.310	0.198	0.279	0.4
17321J	PS92/45-2	4.45	C. neoteretis	6	0.289	0.166	0.190	0.5
16814K	PS92/45-2	1.20	N. pachyderma	10	0.118	0.048	0.056	1.9
16814L	PS92/45-2	1.20	N. pachyderma	10	0.134	0.058	0.080	1.3
16814M	PS92/45-2	1.20	N. pachyderma	10	0.181	0.088	0.217	0.5
16814N	PS92/45-2	1.20	N. pachyderma	10	0.190	0.079	0.132	0.7
16814O	PS92/45-2	1.20	N. pachyderma	10	0.152	0.067	0.112	1.5
16814P	PS92/45-2	1.20	N. pachyderma	10	0.188	0.072	0.200	0.4
16814Q	PS92/45-2	1.20	N. pachyderma	10	0.186	0.086	0.278	0.4
16814R	PS92/45-2	1.20	N. pachyderma	10	0.213	0.088	0.248	0.4
16814S	PS92/45-2	1.20	N. pachyderma	10	0.181	0.099	0.223	0.4
16815A	PS92/45-2	1.59	N. pachyderma	10	0.198	0.086	0.304	0.4
16815B	PS92/45-2	1.59	N. pachyderma	10	0.191	0.080	0.278	0.4
16815C	PS92/45-2	1.59	N. pachyderma	10	0.193	0.078	0.274	0.4

16815D	PS92/45-2	1.59	N. pachyderma	10	0.208	0.093	0.301	0.4
16815E	PS92/45-2	1.59	N. pachyderma	10	0.199	0.091	0.307	0.4
16815F	PS92/45-2	1.59	N. pachyderma	10	0.209	0.085	0.293	0.4
16815G	PS92/45-2	1.59	N. pachyderma	10	0.184	0.073	0.274	0.4
16815H	PS92/45-2	1.59	N. pachyderma	10	0.191	0.081	0.292	0.4
16815I	PS92/45-2	1.59	N. pachyderma	10	0.194	0.096	0.292	0.4
16815J	PS92/45-2	1.59	N. pachyderma	10	0.186	0.080	0.256	0.4
16815K	PS92/45-2	1.59	N. pachyderma	10	0.191	0.080	0.307	0.4
16817I	PS92/45-2	3.12	N. pachyderma	10	0.067	0.026	0.017	1.9
16817J	PS92/45-2	3.12	N. pachyderma	10	0.174	0.073	0.076	0.7
16817K	PS92/45-2	3.12	N. pachyderma	10	0.269	0.114	0.185	0.8
16817L	PS92/45-2	3.12	N. pachyderma	10	0.336	0.127	0.303	0.4
16817M	PS92/45-2	3.12	N. pachyderma	10	0.279	0.143	0.235	0.5
16817N	PS92/45-2	3.12	N. pachyderma	10	0.286	0.148	0.203	0.6
16817O	PS92/45-2	3.12	N. pachyderma	10	0.242	0.091	0.139	0.8
16817P	PS92/45-2	3.12	N. pachyderma	10	0.049	0.015	0.007	3.0
16818G	PS92/45-2	4.13	N. pachyderma	10	0.286	0.138	0.152	1.7
16818H	PS92/45-2	4.13	N. pachyderma	10	0.359	0.180	0.261	0.5
16818I	PS92/45-2	4.13	N. pachyderma	10	0.326	0.153	0.183	0.5
16818J	PS92/45-2	4.13	N. pachyderma	10	0.346	0.176	0.231	0.5
16818K	PS92/45-2	4.13	N. pachyderma	10	0.348	0.194	0.283	0.7
16818L	PS92/45-2	4.13	N. pachyderma	10	0.269	0.125	0.153	1.2
16818M	PS92/45-2	4.13	N. pachyderma	11	0.320	0.140	0.159	1.1
17531A	PS92/45-2	4.45	N. pachyderma	12	0.322	0.146	0.181	0.5
17531B	PS92/45-2	4.45	N. pachyderma	12	0.342	0.183	0.316	0.3
17531D	PS92/45-2	4.45	N. pachyderma	12	0.380	0.222	0.402	0.3
17531E	PS92/45-2	4.45	N. pachyderma	12	0.372	0.213	0.324	0.3
17531F	PS92/45-2	4.45	N. pachyderma	12	0.355	0.191	0.328	0.3
17531G	PS92/45-2	4.45	N. pachyderma	12	0.340	0.165	0.196	0.5
17531H	PS92/45-2	4.45	N. pachyderma	12	0.369	0.212	0.363	0.3
17531I	PS92/45-2	4.45	N. pachyderma	12	0.346	0.176	0.329	0.3
17531J	PS92/45-2	4.45	N. pachyderma	12	0.371	0.200	0.354	0.3
17531K	PS92/45-2	4.45	N. pachyderma	12	0.376	0.208	0.303	0.3
17531L	PS92/45-2	4.45	N. pachyderma	12	0.290	0.131	0.133	0.6
16819G	PS92/45-2	4.73	N. pachyderma	10	0.367	0.184	0.171	0.5
16819H	PS92/45-2	4.73	N. pachyderma	10	0.233	0.105	0.077	1.0
16819I	PS92/45-2	4.73	N. pachyderma	10	0.330	0.169	0.101	0.7
16819J	PS92/45-2	4.73	N. pachyderma	10	0.538	0.447	0.531	0.3
16819K	PS92/45-2	4.73	N. pachyderma	10	0.385	0.207	0.184	0.5
16819L	PS92/45-2	4.73	N. pachyderma	10	0.367	0.195	0.186	0.5
16822H	PS92/54-1	1.79	N. pachyderma	10	0.172	0.074	0.207	0.8
16822I	PS92/54-1	1.79	N. pachyderma	10	0.172	0.082	0.258	0.4
16822J	PS92/54-1	1.79	N. pachyderma	10	0.156	0.061	0.226	0.6
16822K	PS92/54-1	1.79	N. pachyderma	10	0.131	0.046	0.094	0.8
16822L	PS92/54-1	1.79	N. pachyderma	10	0.154	0.061	0.143	0.6
16822M	PS92/54-1	1.79	N. pachyderma	10	0.182	0.079	0.184	0.5
16822N	PS92/54-1	1.79	N. pachyderma	4	0.162	0.067	0.217	0.4
16826G	PS92/54-1	4.66	N. pachyderma	10	0.407	0.223	0.205	0.9
16826H	PS92/54-1	4.66	N. pachyderma	10	0.183	0.046	0.029	2.3
16826I	PS92/54-1	4.66	N. pachyderma	10	0.420	0.269	0.349	0.6
16826J	PS92/54-1	4.66	N. pachyderma	10	0.305	0.130	0.091	1.7
16826K	PS92/54-1	4.66	N. pachyderma	10	0.195	0.053	0.044	2.0
16826L	PS92/54-1	4.66	N. pachyderma	10	0.203	0.066	0.047	2.2
16826M	PS92/54-1	4.66	N. pachyderma	10	0.196	0.052	0.033	2.1
16826N	PS92/54-1	4.66	N. pachyderma	12	0.389	0.223	0.512	0.2
16826O	PS92/54-1	4.66	N. pachyderma	12	0.387	0.210	0.444	0.3
16826P	PS92/54-1	4.66	N. pachyderma	12	0.397	0.225	0.503	0.2
16826Q	PS92/54-1	4.66	N. pachyderma	12	0.410	0.240	0.486	0.3
16826R	PS92/54-1	4.66	N. pachyderma	12	0.379	0.215	0.486	0.3
16826S	PS92/54-1	4.66	N. pachyderma	12	0.405	0.228	0.473	0.3
16826T	PS92/54-1	4.66	N. pachyderma	12	0.397	0.233	0.493	0.3
16826U	PS92/54-1	4.66	N. pachyderma	8	0.399	0.220	0.434	0.3
16827G	PS92/54-1	4.94	N. pachyderma	10	0.333	0.170	0.244	1.4
16827H	PS92/54-1	4.94	N. pachyderma	10	0.367	0.183	0.238	0.5
16827I	PS92/54-1	4.94	N. pachyderma	10	0.307	0.117	0.140	0.7
16827J	PS92/54-1	4.94	N. pachyderma	10	0.377	0.208	0.300	0.5
16827K	PS92/54-1	4.94	N. pachyderma	10	0.399	0.214	0.328	0.3
16827L	PS92/54-1	4.94	N. pachyderma	10	0.343	0.153	0.154	0.7
16828F	PS92/54-1	5.1	N. pachyderma	7	0.257	0.118	0.128	0.8
16828G	PS92/54-1	5.1	N. pachyderma	10	0.360	0.199	0.277	0.4
16828H	PS92/54-1	5.1	N. pachyderma	10	0.325	0.163	0.178	0.5
16828I	PS92/54-1	5.1	N. pachyderma	10	0.349	0.198	0.317	0.3
17322A	PS92/54-1	1.47	C. neoteretis	7	0.178	0.066	0.170	0.5
17322B	PS92/54-1	1.47	C. neoteretis	7	0.174	0.056	0.147	0.5
17322C	PS92/54-1	1.47	C. neoteretis	7	0.183	0.079	0.184	0.5
17322D	PS92/54-1	1.47	C. neoteretis	7	0.155	0.061	0.148	0.5

17322E	PS92/54-1	1.47	C. neoteretis	7	0.185	0.080	0.167	0.4
17323A	PS92/54-1	1.79	C. neoteretis	7	0.157	0.056	0.158	0.5
17323B	PS92/54-1	1.79	C. neoteretis	7	0.161	0.058	0.171	0.5
17323C	PS92/54-1	1.79	C. neoteretis	7	0.150	0.053	0.151	0.5
17323D	PS92/54-1	1.79	C. neoteretis	7	0.150	0.051	0.161	0.5
17323E	PS92/54-1	1.79	C. neoteretis	7	0.155	0.057	0.146	0.6
17323F	PS92/54-1	1.79	C. neoteretis	7	0.153	0.055	0.160	0.5
17324A	PS92/54-1	4.66	C. neoteretis	7	0.325	0.165	0.306	0.4
17324B	PS92/54-1	4.66	C. neoteretis	7	0.200	0.073	0.075	1.0
17324C	PS92/54-1	4.66	C. neoteretis	7	0.332	0.185	0.299	0.4
17324D	PS92/54-1	4.66	C. neoteretis	7	0.324	0.183	0.290	0.5
17324E	PS92/54-1	4.66	C. neoteretis	7	0.472	0.345	0.354	0.8
17324F	PS92/54-1	4.66	C. neoteretis	7	0.303	0.163	0.277	0.4
17324G	PS92/54-1	4.66	C. neoteretis	6	0.312	0.129	0.175	0.8
17325A	PS92/54-1	4.94	C. neoteretis	7	0.331	0.168	0.245	0.5
17325B	PS92/54-1	4.94	C. neoteretis	7	0.411	0.304	0.370	0.6
17325C	PS92/54-1	4.94	C. neoteretis	7	0.345	0.188	0.336	0.4
17325D	PS92/54-1	4.94	C. neoteretis	7	0.265	0.117	0.132	0.7
17325E	PS92/54-1	4.94	C. neoteretis	7	0.303	0.145	0.196	0.5
17325F	PS92/54-1	4.94	C. neoteretis	8	0.324	0.171	0.281	0.4
17326A	PS92/54-1	5.1	C. neoteretis	7	0.303	0.144	0.191	0.5
17326B	PS92/54-1	5.1	C. neoteretis	7	0.286	0.139	0.163	0.5
17326C	PS92/54-1	5.1	C. neoteretis	7	0.304	0.153	0.218	0.5
17326D	PS92/54-1	5.1	C. neoteretis	7	0.313	0.164	0.244	0.4
17326E	PS92/54-1	5.1	C. neoteretis	7	0.316	0.177	0.253	0.8

***Table S1**. Extent of amino acid racemization (D/L) of all subsamples in this study*

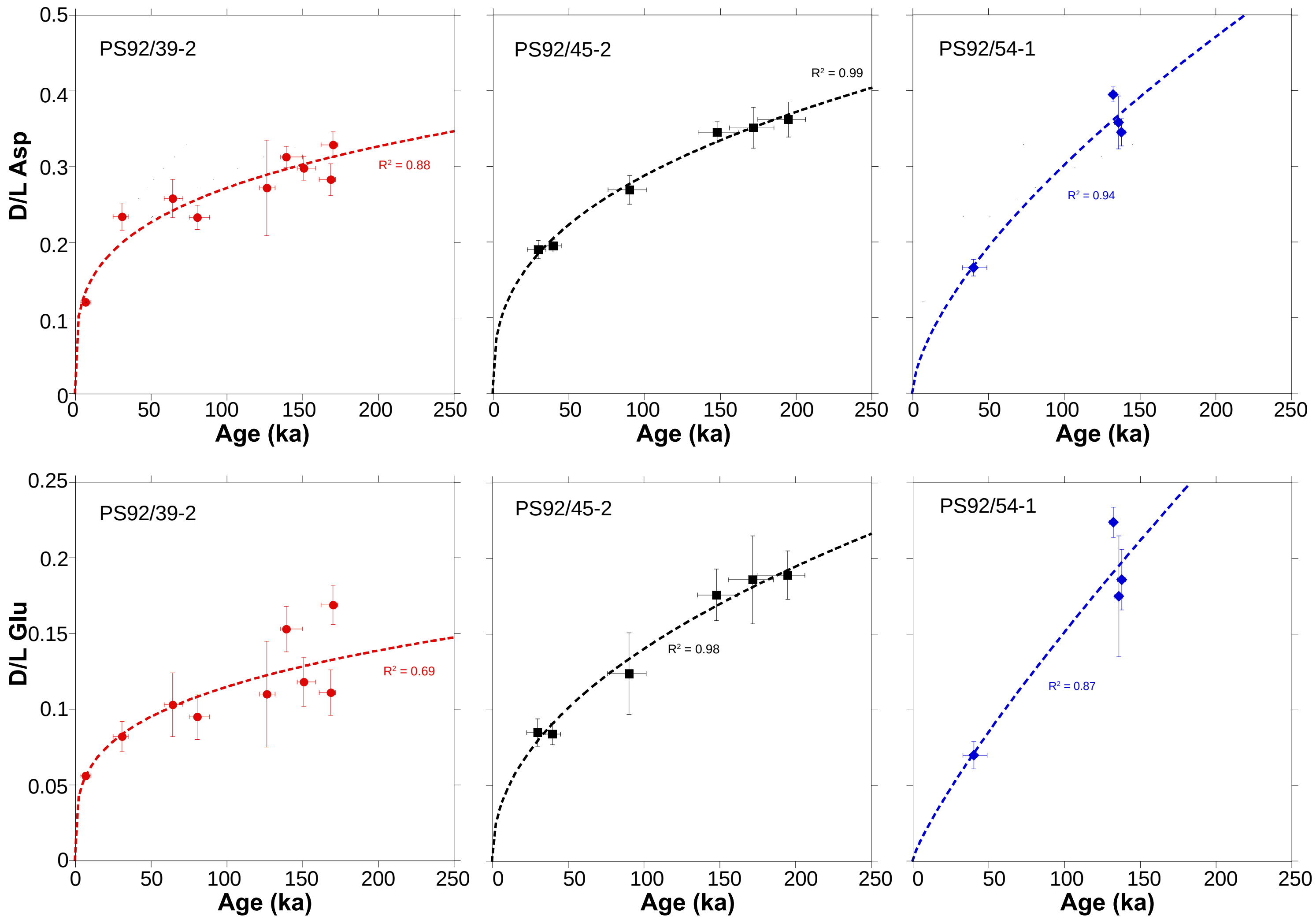
Subsample size test

D/L values of Asp and Glu in *N. pachyderma* subsamples with different number of tests (10 or 20) from the same depths are statistically indistinguishable (Supplementary Table 1). This implies that small subsamples are not significantly influenced by background contamination or other possible sample-size-dependent effects.

Core and number of tests	D/L Asp mean	D/L Asp σ	significance at 0.01	D/L Glu mean	D/L Glu σ	significance at 0.01
PS92/45-2 10 tests	0.283	0.075	t = 0.65 p = .52	0.136	0.046	t = 0.42 p = .68
PS92/45-2 20 tests	0.267	0.074		0.130	0.046	
PS92/54-1 10 tests	0.284	0.103	t = -0.01 p = .99	0.144	0.068	t = -0.07 p = .94
PS92/54-1 20 tests	0.285	0.099		0.145	0.066	

***Table S2**. Mean D/L Asp and Glu values in subsamples of N. pachyderma with 10 and 20 tests*

Figure S1.



Supplementary Figure S1. *Least square regressions (power curves) for mean D/L Asp and Glu values over time for the three cores.*

Paleotemperature calculations

Table S3. summarises elements of the paleotemperature calculations, which followed the steps below:

1. D/L Asp values of *N. pachyderma* were predicted by power-fit functions for each core at 150 ka.
2. The predicted D/L Asp values of *N. pachyderma* samples were converted to equivalent values in P. *obliquiloculata* (increase by 16 %) to account for the difference in the racemization rates of Asp in the two species.
3. Effective diagenetic temperatures (T_{eff}) integrated over the past 150 ka were derived from equation (6) of Kaufman (2006) using the associated parameters (Table 3 Kaufman, 2006).

Core	Estimated D/L Asp in *N. pachyderma* at 150 ka	Equivalent D/L Asp in *P. obliquiloculata*	T_{eff} (ºC)
39-2	0.303	0.361	4.2 ± 0.8
45-2	0.338	0.402	5.8 ± 0.8
54-1	0.395	0.471	8.2 ± 0.8

Table S3. *Data used to calculate effective diagenetic temperatures over the past 150ka*

Uncertainties associated with the mean D/L Asp values and sample ages in the current study are comparable with those of Kaufman (2006), so the uncertainty estimate of ± 0.8ºC in T_{eff} for Asp of Kaufman (2006) was maintained. However, this is considered as a minimum error estimate as conversion between species adds another level of uncertainty, which has not been addressed in the current study.

Alternative paleotemperature calculations

As an alternative approach to approximating paleotemperatures, we relied on the results of previous laboratory heating experiments on *N. pachyderma* (Table 2 in Kaufman et al., 2013), and on D/L Asp values of ^{14}C dated samples from the Arctic Ocean (Table 3 in Kaufman et al. 2013 and ^{14}C dated samples in this study) to quantify the temperature sensitivity of the rate of AAR in this species. We focused on D- and L-Asp because they are the chronographically best resolved amino acid enantiomers. Using a simple power transformation (e.g. Goodfriend et al., 1996) (eq. 1), which describes the D/L versus time relationship and the Arrhenius equation (eq. 2), an equation for paleotemperatures can be derived (3):

$$kt + C = (D/L)^{n} \quad (1)$$

$$k = Ae^{(-Ea/RT)} \quad (2)$$

$$T_{eff} = -E_a / [R \ln ((D/L^{n} - C) / At)] \quad (3)$$

where, k = forward rate constant for a given temperature (yr^{-1}), t = sample age (yr), C = right hand side of equation (1) at t = 0, n = the exponent that best linearises the relation between D/L and sample age, A = frequency factor (yr^{-1}), E_a = activation energy (kcal mol^{-1}), R = gas constant (0.001987 kcal K^{-1} mol^{-1}), T = temperature (K). The value of n was approximated using the procedures of Kaufman (2006), and this yielded n = 3. For the ^{14}C dated samples an initial D/L Asp value of 0.0522 was used based on the relationship between sample age and D/L Asp of the ^{14}C dated samples (Supplementary Table S4).

Core	Depth (m)	Site bottom water temperature (°C)	Age (cal yrs BP)	D/L Asp
HLY0503-18TC	0.9	-0.70	2000	0.060
HLY0503-8JPC	0.5	-0.50	3980	0.080
LOMROG07-08PC	0.25	-0.20	6900	0.085
HLY0503-18TC	7.7	-0.70	7400	0.100
HLY0503-18TC	15.7	-0.70	10900	0.111
HLY0503-18TC	21.7	-0.70	12400	0.122
PS92/45-2	1.59	-0.25	26800	0.195
PS92/39-2	1.5	-0.76	31538	0.234

Table S4. *Mean D/L Asp values and sample ages used to estimate mean initial D/L values in N. pachyderma*

Solving the Arrhenius equation using data from Kaufman et al. (2013) yielded the parameters A and E_a (where $\ln(A)$ = intercept, and $E_a = R$ * the slope of the best fit linear regression line) (Table S5 and Figure S2).

	Temperature (°C)	Slope (k)
Laboratory heated samples		
(Mendeleev Ridge)	140	2.17E+01
	120	8.68E+00
	110	4.38E+00
	80	1.56E-01
^{14}C dated samples		
HLY0503-8JPC	–0.50	1.00319E-07
HLY0503-18TC	–0.70	1.32E-07
LOMROG07-08PC	–0.20	6.84E-08
Arrhenius parameters		
A = 9.65×10^{17} yr^{-1}		
E_a = 31.14 kcal mol^{-1}		

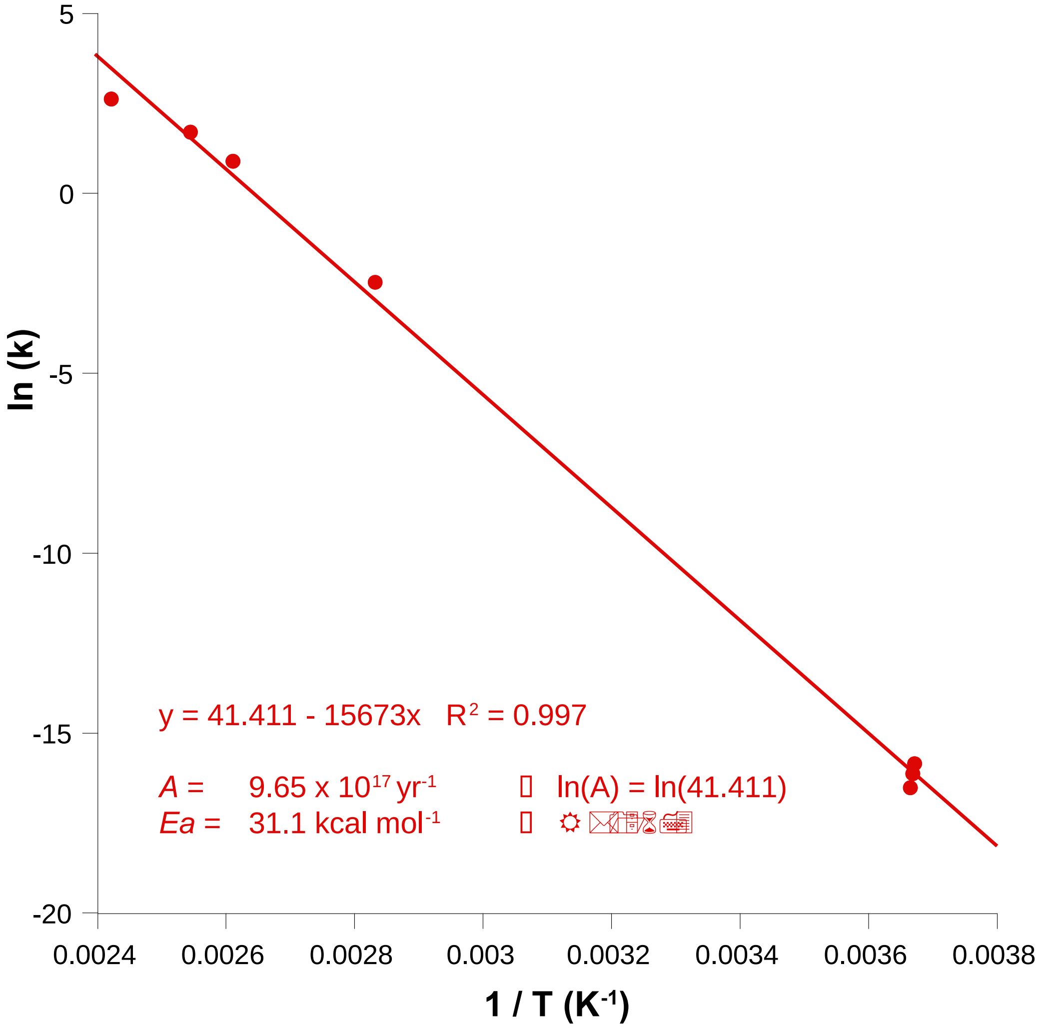
Table S5. *Rate of racemization (k) derived from data reported by Kaufman et al. (2013) and used to calculate Arrhenius parameters for Asp racemization in N. pachyderma.*

The calculated paleotemperatures, with no formal error analysis, reveal that differences in effective diagenetic temperatures (integrated over the past 150 ka) between the three core sites range from 2 to 4.6ºC, similar to the results of the previous temperature calculations (Table S6.).

Core	Age (ka)	D/L Asp (predicted by regression analysis)	Calculated paleotemperature (ºC)	Calculated paleotemperature using Pulleniatina(ºC)
PS92/39-2	150	0.303	+ 2.2	+ 4.2
PS92/45-2	150	0.338	+ 3.8	+ 5.8
PS92/54-1	150	0.395	+ 6.8	+ 8.2

Table S6. *Approximate effective diagenetic temperatures at the three core sites integrated over the past 150 ka*.

Figure S2.



Supplementary Figure S2. *Arrhenius plot for aspartic acid racemization in laboratory heated and ^{14}C dated N. pachyderma samples. Underlying data from Kaufman et al. (2013)*