

Table S1. Radiocarbon dates for MD02-2550 measured on foraminifera (*G. ruber*; pink and white variety for CAMS dates, pink variety only for ETH dates). CAMS dates 100670-100676 are from LoDico et al. (2006). Conversion to calendar years BP was performed with the software CALIB 5.0 (Stuiver and Reimer, 1993) using the calibration curve Marine04 (Hughen et al., 2004).

Lab number	Sample depth (cm)	Radiocarbon age	Calibrated age range (1 sigma)	calendar age (median) (year before present)
CAMS 100668	167.0-167.5	3120 ± 45	2830-2962	2900
CAMS 100669	175.0-175.5	3025 ± 40	2745-2832	2790
CAMS 100670	190.0-190.5	6510 ± 35	6957-7084	7020
CAMS 100671	210.0-210.5	7450 ± 40	7865-7953	7910
CAMS 100672	230.0-230.5	8050 ± 35	8451-8549	8500
CAMS 100673	250.0-250.5	8330 ± 40	8850-8987	8910
CAMS 100674	270.5-271.0	8815 ± 40	9451-9514	9480
CAMS 100675	290.0-290.5	9285 ± 40	10101-10195	10140
CAMS 100676	307.5-308.0	9790 ± 40	10577-10683	10640
ETH 28012	374.5-377.0	11170 ± 85	12743-12862	12800
ETH 28013	434.0-436.0	12910 ± 85	14394-14880	14610
ETH 28014	563.5-565.5	14470 ± 110	16538-17007	16770
ETH 28015	902.0-904.0	20340 ± 160	23676-24110	23880

Table S2. Kerogen composition in Orca Basin core MD02-2550. Given are abundances of different palynomorph groups in percent of total counted particles. For some palynomorph groups, the percentage of particles classified as opaque/reworked out of the total particles in that group is given as well.

core depth (cm)	90	300	370	455	500	755
No. of particles counted	283	310	308	331	295	325
zooclasts	46.6	27.7	4.2	8.5	0.7	1.2
translucent phytoclasts	30.4	44.8	67.5	61.3	48.8	57.9
opaque phytolasts	4.6	5.2	7.8	8.5	6.8	15.1
% opaque/total phytoclasts	13.1	10.3	10.3	12.1	12.2	20.7
dinocysts	6.0	7.1	2.9	6.0	8.8	4.9
reworked dinocysts	0.0	0.0	0.0	0.3	5.1	3.7
% reworked/total dinocysts	0.0	0.0	0.0	4.7	36.6	42.9
prasinophytes	0.4	0.3	1.0	0.0	1.7	1.9
<i>Botryococcus</i>	0.7	0.3	1.0	0.9	1.0	0.3
bisaccate pollen grains	4.2	6.8	9.4	2.1	7.8	4.9
reworked bisaccate pollen grains	0.0	0.3	1.0	0.6	4.8	4.0
other pollen grains	3.5	6.5	2.6	10.0	8.5	1.5
reworked other pollen grains	0.0	0.0	0.0	0.3	1.4	1.5
% reworked/total pollen grains	0.0	2.4	7.5	6.9	27.3	46.2
spores	2.1	0.7	0.7	0.9	0.3	0.0
reworked spores	0.0	0.0	2.0	0.6	3.7	3.1
% reworked/total spores	0.0	0.0	75.0	39.7	91.6	100.0
% reworked/total spores+pollen gr.	0.0	2.3	18.7	10.4	37.2	57.2
filaments	1.4	0.3	0.0	0.0	0.7	0.0

Table S3. Sums of long-chain n-alkanes ($n\text{-C}_{25}$ - $n\text{-C}_{31}$, except $n\text{-C}_{28}$ due to co-elution) from core MD02-2550 as well as concentrations of unresolved complex mixture (UCM), obtained from integrating humps of GC chromatograms underneath n-alkane peaks. Also given are carbon preference index (CPI) and average chain length (ACL):

$$\text{CPI} = ([n\text{-C}_{27}] + [n\text{-C}_{31}]) / ([n\text{-C}_{26}] + [n\text{-C}_{30}]);$$

$$\text{ACL} = (27[n\text{-C}_{27}] + 29[n\text{-C}_{29}] + 31[n\text{-C}_{31}]) / [n\text{-C}_{27}][n\text{-C}_{29}][n\text{-C}_{31}].$$

Both indices were not very sensitive to a different set of input carbon numbers.

core depth (cm)	calendar age (ka)	sum n -alkanes ($\mu\text{g/g}$ TOC)	UCM (mg/g TOC)	CPI	ACL
40	0.66	263	0.37	2.77	29.2
90	1.49	213	0.55	2.78	29.6
140	2.32	250	0.67	1.91	29.3
200	7.37	334	0.46	1.65	29.1
245	8.74	159	0.07	1.08	29.1
295	10.27	357	2.01	1.77	29.2
315	10.88	198	0.07	2.67	29.3
330	11.34	250	0.75	2.36	29.2
340	11.64	179	0.20	2.16	29.4
350	11.95	209	0.88	1.90	29.2
365	12.41	327	0.77	1.77	29.2
380	12.86	458	0.66	2.92	29.2
390	13.17	348	1.10	2.87	29.1
400	13.47	363	0.60	1.86	29.2
410	13.78	135	0.71	3.03	29.0
420	14.09	231	1.05	1.95	29.0
430	14.39	187	0.40	1.93	29.0
440	14.66	763	3.66	1.39	28.8
445	14.76	373	0.09	3.08	28.8
450	14.85	584	1.91	2.15	28.8
455	14.94	273	0.20	2.93	29.0
460	15.04	340	1.37	1.61	28.8
470	15.23	591	2.24	1.44	28.8
480	15.41	395	0.64	3.02	28.9
490	15.60	251	0.79	2.64	29.0
505	15.88	282	0.10	2.76	28.8
530	16.35	268	1.86	3.09	28.9
555	16.83	256	1.74	1.74	29.0
560	16.92	331	3.83	2.78	29.1
565	17.01	352	0.47	2.20	29.1
570	17.11	564	3.11	1.51	28.9
580	17.30	511	1.15	2.10	29.2
590	17.48	337	0.64	2.25	29.1
630	18.24	266	0.53	3.43	28.9
670	18.99	210	0.28	2.40	29.0
710	19.74	217	0.58	3.50	29.4
750	20.50	465	2.43	3.20	28.8
790	21.25	153	0.06	3.34	29.2
830	22.00	298	1.01	1.87	28.9
870	22.75	629	0.95	2.66	29.0

