

Supplementary material

Table 1. Location of Mediterranean sediment cores in which the elemental proxies considered in this paper were analyzed for the time interval spanning the last 50 ka.

Core	Latitude	Longitude	Depth (m.b.s.l.)	Elemental ratios	References
Westernmost Mediterranean: Alboran Sea basin					
293G	36°10.414'N	2°45.280'W	1,840	Si/Al, Ti/Al, Zr/Al, Mg/Al, K/Al, Rb/Al, Zn/Al, Cu/Al, V/Al, Mn/Al, Fe/Al, U/Th, Ba/Al	Rodrigo-Gámiz et al., 2011
ODP Site 976	36°12.313'N	4°18.763'W	1,108	Zr/Al, La/Lu, Ni/Al, Co/Al, U/Al, U/Th, Ba/Al, Mg/Al	Martín-Puertas et al., 2010; Martínez-Ruiz et al., 2003
300G	36°21.532'N	1°47.507'W	1,860	Si/Al, Zr/Al, Mg/Al, K/Al, Ba, Mn/Al, U/Th	Jiménez-Espejo et al., 2008; Martín-Puertas et al., 2010; Rogerson et al., 2008
302G	36°01.906'N	1°57.317'W	1,989	Mg/Al, Ba	Jiménez-Espejo et al., 2008
304G	36°19.873'N	1°31.631'W	2,382	Mg/Al, Ba	Jiménez-Espejo et al., 2008
384B	35°59.161'N	4°44.976'W	1,022	Si/Zr, K/Zr, Zr/Al, Zr/Rb, V/Al, V/Cr, Ni/Co, Br/Al	Nieto-Moreno et al., 2013a,b
436B	36°12.318'N	4°18.800'W	1,108	Si/Zr, K/Zr, Zr/Al, Zr/Rb, V/Al, V/Cr, Ni/Co, Br/Al	Nieto-Moreno et al., 2013a,b
MD 95-2043	36°8.6'N	2°37.3'W	1,841	Si/(Si+K), Cu/Al, Cr/Al, V/Al, Zn/Al, Mn/Al, Ba exc	Moreno et al., 2002, 2005
Westernmost Mediterranean: Algerian-Balearic basin					
305G	36°23.603'N	1°22.710'W	2,512	Si/Al, Ti/Al, Zr/Al, Mg/Al, K/Al, Rb/Al, Zn/Al, Cu/Al, V/Al, Cr/Al, Ni/Al, Br/Al, Mn/Al, Fe/Al, Co/Al, Mo/Al, U/Th, Ba/Al, REE/Al	Moreno et al., 2012; Nieto-Moreno et al., 2011
306G	36°27.846'N	1°11.166'W	2,574	Si/Al, Ti/Al, Zr/Al, Mg/Al, K/Al, Rb/Al, Zn/Al, Cu/Al, V/Al, Cr/Al, Ni/Al, Br/Al, Mn/Al, Fe/Al, Co/Al, Mo/Al, U/Th, Ba/Al, REE/Al	Moreno et al., 2012; Nieto-Moreno et al., 2011
ODP161 975	38°53.795'N	4°30.596'E	2,416	Zr/Al, Ti/Al, Mg/Al, K/Al, Ba/Al, Fe/Al, Mn/Al, U/Al, U/Th, Cr/Al, Co/Al	Jiménez-Espejo et al., 2007, 2008; Rogerson et al., 2008

MD99-2343	40°29.840'N	4°01.690'E	2,391	Si/Al, Ti/Al, K/Al, Ca/Al	Frigola et al., 2007, 2008
274G	37°15.96'N	00°02.99'W	2,587	Zr/Al, La/Lu, Ni/Al, Co/Al, U/Al, U/Th, Ba/Al	Martinez-Ruiz et al., 2003
SL87	38°59.39'N	4°01.40'E	1,900	Ba, Si/Al, Ti/Al, CaCO ₃	Weldeab et al., 2003
Northwestern Mediterranean: Gulf of Lyon					
PB06	43°29.544'N	3°51.246'E	1	Si/Al, Zr/Al	Sabatier et al., 2012
Central Mediterranean: Tyrrhenian Sea					
MD90-917	41°18'N	17°37'E	1,010	Ba/Al	Slomp et al., 2004
Eastern Mediterranean: Ionian Sea					
M25	36°44.75'N	17°43.05'E	3,376	Zr/Al, La/Lu, Ni/Al, Co/Al, U/Al, U/Th, Ba/Al, I, Br, K, Rb, Ti, Mn, Sb, As, Cu, Zn	Martinez-Ruiz et al., 2000, 2003
GL94	36°04.75'N	21°58.03'E	2,687	Zr/Al, La/Lu, Ni/Al, Co/Al, U/Al, U/Th, Ba/Al, I, Br, K, Rb, Ti, Mn, Sb, As, Cu, Zn	Martinez-Ruiz et al., 2000, 2003
ODP Site 964	36°15.627'N	17°45.007'E	3,658	Zr/Al, La/Lu, Ba/Al, Co/Al, Ni/Al, Mo/Al, Mn/Al, V/Cr, V/Sc, Ni/Co, V/(V+Ni), U/Th	Gallego-Torres et al., 2007, 2011
ODP963	37°01.938'N	13°10.896'E	470	Si, Ti, Al, Fe, Mg, Na, K, P, Ba, Mn, Rb, Sr, Y, Zr	Böttcher et al., 2003
PS25PC	35°17.400'N	21°24.800'E	3,304	V/Al, Mo/Al, Ba/Al	Kraal et al., 2010
BP15	32°47.280'N	19°52.560'E	665	Ba/Al, Sr/Ca, Ti/Al	Reitz and de Lange, 2006
BP18	33°06.000'N	19°46.380'E	1,850	Ba/Al, Sr/Ca, Ti/Al	Reitz and de Lange, 2006
GeoB10701-4	40°00.010'N	17°28.008'E	1,187	Ba/Al	Möbius et al., 2010
GeoB10702-3	40°00.010'N	17°35.100'E	910	Ba/Al	Möbius et al., 2010
GeoB10703-3	39°59.400'N	17°44.460'E	277	Ba/Al	Möbius et al., 2010
MD04-2797CQ	36°34.200'N	11°24.000'E	771	K, Ti, Zr, Al	Bout-Roumazeilles et al., 2013
Eastern Mediterranean: Levantine Sea					
M51-3-567	34°48.800'N	27°16.98'E	2,154	Br/Cl, Ca/Al, Ti/Al, Si/Al, Ba/Al, Fe/Al, Mo/Al	Moller et al., 2012
M51-3-568	34°48.890'N	27°16.96'E	2,155	Al, Ca, Ti, Fe, Ba, Mo	Moller et al., 2012
ODP Site 967	34°04.098'N	32°43.523'E	2,705	Ba/Al, S, Fe/Al, Mn/Al, Mo/Al, V/Al, U/Al	Azrieli-Tal et al., 2014
ODP Site 967	34°04.098'N	32°43.523'E	2,705	Ba/Al, Mn/Al, Mo/Al, V/Mo, U _{aut} , V/Al, Zr-Hf, La/Lu	Gallego-Torres et al., 2010, 2011

ODP Site 966	33°47.799'N	32°42.095'E	926	Ba/Al, Mn/Al, Mo/Al, V/Mo, U _{aut} , V/Al, Zr-Hf, La/Lu	Gallego-Torres et al., 2010, 2011
KC19	33°47.850'N	28°36.500'E	2,750	Ba, Fe, Mn	Slomp et al., 2004
Station 07.	34°19.200'N	20°02.700'E	2,703	Mn/Al, Fe/Al, S, C _{org}	Higgs et al., 1994
Station 12	33°23.700'N	25°01.300'E	2,211	Mn/Al, Fe/Al, S, C _{org}	Higgs et al., 1994
P362/2-33	31°40.510'N	29°45.000'E	30	Al, Mn, Ba, Ti, Ca	Blanchet et al., 2013
MS27PT	31°47.090'N	29°27.700'E	1,389	MnO, CaO, Ba, S, Ti, Fe, Si/Al	Revel et al., 2010
PS009PC	32°07.700'N	34°24.400'E	552	Ba/Al, V/Al, Ti/Al, C _{org}	Hennekam et al., 2014

Eastern Mediterranean: Mediterranean Ridge

BAN89GC09	33°37.980'N	24°43.290'E	2,000	Mg/Al, Mo/Al, Ti/Al, K/Al, Co/Al	Sangiorgi et al., 2006
ODP Site 969	33°50.399'N	24°53.065'E	2,211	Ba/Al, Mn/Al, Mo/Al, V/Mo, U _{aut} , V/Al, Zr-Hf, La/Lu	Gallego-Torres et al., 2010, 2011
PP44PC	35°14.200'N	21°29.980'E	3,400	Ba, Mo, V, U	Jilbert et al., 2010
SIN97-01GC	35°49.070'N	22°42.020'E	933	Mn/Al, Fe/Al, Ca/Fe, Sr/Ca, Cl/Al, Ti/Al, Ca/Ti, Ca/Al, Mg/Al	Gennari et al., 2009
KC19C	33°47.850'N	28°36.500'E	2,750	Ba, Fe, Mn	Passier et al., 1998

Eastern Mediterranean: Aegean Sea

SL60	35°39.690'N	26°34.990'E	1,522	Ba, Fe, Mn	Slomp et al., 2004
31G	35°48.500'N	23°12.300'E	604	Ca, Mg, Sr, Ba, Si, Al, Ti, K, Li, Zr, Y, Be, Fe, Mn, Ni, Co, Cr, Cu, P, Zn, V, Mo, U, As, Sb, Th	Pruysers et al., 1991
9G	34°49.900'N	25°38.200'E	565	Ca, Mg, Sr, Ba, Si, Al, Ti, K, Li, Zr, Y, Be, Fe, Mn, Ni, Co, Cr, Cu, P, Zn, V, Mo, U, As, Sb, Th	Pruysers et al., 1991

References not included in the text

Böttcher, M. E., Rinna, J., Warning, B., Wehausen, R., Howell, M. W., Schnetger, B., Steind, R., Brumsack, H. J., Rullkötter, J., 2003. Geochemistry of sediments from the connection between the western and the eastern Mediterranean Sea (Strait of Sicily, ODP Site 963). *Palaeogeogr. Palaeoclimatol. Palaeoecol.* 190, 165-194.

Gennari, G., Tamburini, F., Ariztegui, D., Hajdas, I., Spezzaferri, S., 2009. Geochemical evidence for high-resolution variations during deposition of the Holocene S1 sapropel on the Cretan Ridge, Eastern Mediterranean. *Palaeogeogr. Palaeoclimatol. Palaeoecol.* 273, 239-248.

Kraal, P., Slomp, C. P., de Lange, G. J., 2010. Sedimentary organic carbon to phosphorus ratios as a redox proxy in Quaternary records from the Mediterranean. *Chem. Geol.* 277, 167-177.

- Möbius, J., Lahajnar, N., Emeis, K. C., 2010. Diagenetic control of nitrogen isotope ratios in Holocene sapropels and recent sediments from the Eastern Mediterranean Sea. *Biogeosciences*, 7, 3901-3914.
- Moller, T., Schulz, H., Hamann, Y., Dellwig, O., Kucera, M., 2012. Sedimentology and geochemistry of an exceptionally preserved last interglacial sapropel S5 in the Levantine Basin (Mediterranean Sea). *Mar. Geol.* 291, 34-48.
- Passier, H. F., Dekkers, M. J., de Lange, G. J., 1998. Sediment chemistry and magnetic properties in an anomalously reducing core from the eastern Mediterranean Sea. *Chem. Geol.* 152, 287-306.
- Pruysers, P. A., de Lange, G. J., Middelburg, J. J., 1991. Geochemistry of eastern Mediterranean sediments: Primary sediment composition and diagenetic alterations. *Mar. Geol.* 100, 137-154.
- Reitz, A., de Lange, G. J., 2006. Abundant Sr-rich aragonite in eastern Mediterranean sapropel S1: Diagenetic vs. detrital/biogenic origin. *Palaeogeogr. Palaeoclimatol. Palaeoecol.* 235, 135-148.
- Revel, M., Ducassou, E., Grousset, F.E., Bernasconi, S.M., Migeon, S., Revillon, S., Mascle, J., Murat, A., Zaragosi, S., Bosch, D., 2010. 100,000 Years of African monsoon variability recorded in sediments of the Nile margin. *Quat. Sci. Rev.* 29, 1342-1362.
- Sabatier, P., Dezileau, L., Colin, C., Briquieu, L., Bouchette, F., Martinez, P., Siani, G., Raynal, O., Von Grafenstein, U., 2012. 7000 years of paleostorm activity in the NW Mediterranean Sea in response to Holocene climate events. *Quat. Res.* 77, 1-11.
- Sangiorgi, F., Dinelli, E., Maffioli, P., Capotondi, L., Giunta, S., Morigi, C., Principato, M. S., Negri, A., Emeis, K. C., Corselli, C., 2006. Geochemical and micropaleontological characterisation of a Mediterranean sapropel S5: a case study from core BAN89GC09 (south of Crete). *Palaeogeogr. Palaeoclimatol. Palaeoecol.* 235, 192-207.
- Slomp, C. P., Thomson, J., de Lange, G. J., 2004. Controls on phosphorus regeneration and burial during formation of eastern Mediterranean sapropels. *Mar. Geol.* 203, 141-159.
- Weldeab, S., Siebel, W., Wehausen, R., Emeis, K. C., Schmiedl, G., Hemleben, C., 2003. Late Pleistocene sedimentation in the Western Mediterranean Sea: implications for productivity changes and climatic conditions in the catchment areas. *Palaeogeogr. Palaeoclimatol. Palaeoecol.* 190, 121-137.