Supplementary information

Determination of offsets from oxygen-isotope equilibrium in *Cypretta brevisaepta*

Offsets from oxygen-isotope equilibrium in ostracod shell calcite have been well documented (von Grafenstein et al., 1999; Holmes and Chivas, 2002) but not previously quantified for the genus *Cypretta*. We measured the oxygen-isotope composition of single specimens of *Cypretta brevisaepta* from various sites on Wallywash Great Pond as well as a small pond (Site P1) to the north (Fig. S1). Results (Table S1) confirm positive offsets from oxygen-isotope equilibrium for *Cypretta* as for other taxa. We believe that the contrasting values from site WGP1 and the plankton tow (tow1) compared with the two other sites probably relates to the more temporally variable isotopic composition of the main body of the lake from which WGP1 and tow 1 were collected, meaning that the isotopic composition of lake water at the time of specimen collection may have differed from that at the time of shell formation. We therefore determine the offset of +1.70 ± 0.22 ‰ based on results from WGP3 and P1 alone.

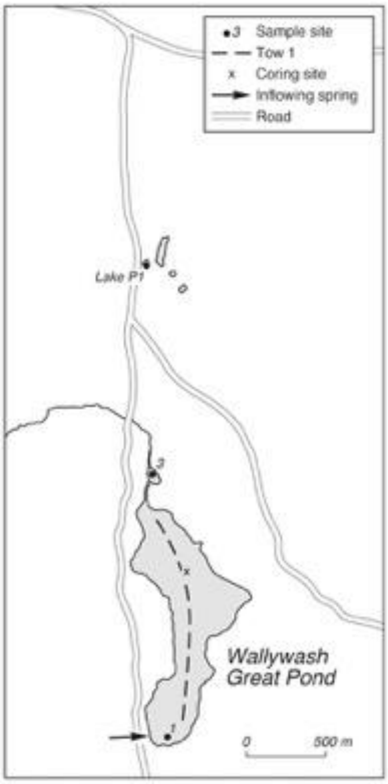

Fig. S1. Sites from which modern ostracods were collected.

Table S1. Oxygen and carbon isotope composition of modern *Cypretta brevisaepta* from Wallywash Great Pond and nearby. Offsets from oxygen-isotope equilibrium represent the difference between the measured ostracod oxygen-isotope values and the theoretical value for oxygen-isotope equilibrium for calcite for each site based on water temperature and water isotope composition, using Kim and O'Neil (1997).

Site	T °C	$\delta^{13}C_{ostracod}$ ‰ VPDB	$\delta^{18}O_{ostracod}$ ‰ VPDB	$\delta^{18}O_{water}$ ‰ VSMOW	Vital offset ‰
WGP3	29.8	-0.40	1.38	2.70	1.98
	29.8	-0.37	1.28	2.70	1.88
	29.8	-0.41	1.04	2.70	1.64
	29.8	-0.63	0.56	2.70	1.16
	29.8	-0.56	1.33	2.70	1.93
	29.8	-0.51	1.26	2.70	1.86
	29.8	-0.53	1.20	2.70	1.80
	29.8	-0.38	1.29	2.70	1.89
	29.8	-0.76	0.98	2.70	1.58
	29.8	-0.65	0.88	2.70	1.48
				Mean	1.72
				SD	0.26
WGP1	29.2	-2.06	-0.73	0.90	1.56
	29.2	-1.99	-0.72	0.90	1.57
	29.2	-4.93	-1.95	0.90	0.34
	29.2	-3.63	-1.60	0.90	0.69
				Mean	1.04
				SD	0.62
Tow 1	28.3	-0.38	-0.07	1.84	1.09
	28.3	-0.23	-0.24	1.84	0.92
	28.3	-0.39	-0.32	1.84	0.84
	28.3	-0.36	-0.31	1.84	0.85
				Mean	0.93
				SD	0.12
P1	30.4	-4.83	2.31	4.00	1.73
	30.4	-4.88	2.28	4.00	1.70
	30.4	-4.88	2.16	4.00	1.58
	30.4	-5.00	2.20	4.00	1.62
				Mean	1.66
				SD	0.07
				Sites 3 and P1	
				Mean	1.70
				SD	0.22

Hydroclimate variations during the late Holocene in the Circum-Caribbean region.

Table S2 Key to sites for which hydroclimate inferences are available for the TCP and LIA, as shown in Fig. 8 in the main paper.

Site Number	Site name	Site type	Hydroclimate proxy	Reference
1	Juxtlahuaca Cave, Mexico	Speleothem	$d^{18}O_{carb}$	Lachniet et al. 2017
2	Aljojuca, E. Cuenca Oriental, Mexico	Lake sediment	$d^{18}O_{carb}$	Bhattacharya et al. 2015
3	Laguna Yaloch, Guatemala	Lake sediment	%CaCO3	Wahl et al. 2013
4	Salpetén, Guatemala	Lake sediment	$d^{2}H_{leaf\ wax}$	Douglas et al. 2015
5	Aguada X'Caamal, Mexico	Lake sediment	$d^{18}O_{carb}$	Hodell et al. 2005a
6	Yaal Chac, Mexico	Lake sediment	$d^{18}O_{carb}$	Metcalfe et al. 2022
7	Tzabnah Cave, Mexico	Speleothem	$d^{18}O_{carb}$	Medina-Elizalde et al. 2010
8	Macal Chasm Cave, Belize	Speleothem	$d^{18}O_{carb}$ and other proxies	Webster et al. 2007
9	Yok Balum, Belize	Speleothem	$d^{18}O_{carb}$	Kennett et al. 2012
10	Lake Chichancanab, Mexico	Lake sediment	$d^{18}O_{carb}$	Hodell et al. 1995
		Lake sediment	$d^{2}H_{leaf\ wax}$	Douglas et al. 2015
		Lake sediment	gypsum content	Hodell et al. 2005b
11	Lake Punta Laguna, Mexico	Lake sediment	$d^{18}O_{carb}$	Curtis et al. 1995
12	Lago El Gancho, Nicaragua	Lake sediment	$d^{18}O_{carb}$	Stansell et al. 2013
13	Lago Morrenas, Costa Rica	Lake sediment	$d^{13}C$ and charcoal	Wu et al. 2019
14	Lago Ditkebi, Coast Rica	Lake sediment	Organic sediment geochemistry and charcoal	Wu and Porinchu 2020.
15	Dos Anas cave, Cuba	Speleothem	$d^{18}O_{carb}$	Fensterer et al. 2012
16	Chilibrillo Cave, Panama	Speleothem	$d^{18}O_{carb}$	Lachniet et al. 2004
17	Wallywsh Great Pond, Jamaica	Lake sediment	$d^{18}O_{carb}$	This study
18	Lake Miragoane, Haiti	Lake sediment	$d^{18}O_{carb}$	Hodell et al. 1991
19	Laguna Castilla and Laguna de Salvador, Dominican Republic	Lake sediment	$d^{2}H_{leaf\ wax}$	Lane et al. 2009, 2014
20	Laguna Felipe, Domincan Republic	Lake sediment	$d^{2}H_{leaf\ wax}$	Lane et al. 2011
21	Perdido Cave, Puerto Rico	Speleothem	$d^{18}O_{carb}$	Winter et al. 2011
22	Cariaco Basin	Marine sediment	Ti content	Haug et al. 2001
23	Harrison's Cave, Barbados	Speleothem	$d^{18}O_{carb}$	Ouellette 2013
24	Lake Valencia, Venezuela	Lake sediment	$d^{18}O_{carb}$	Curtis et al.1999

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