

## Supplementary material

Table S1. Northern Neotropical fossil records for two endemic (*Cypria petenensis*, *Paracythereis opesta*) and two non-endemic (*Cytheridella ilosvayi*, *Darwinula stevensoni*) ostracode species.

	Locality	<i>Cypria petenensis</i>	<i>Paracythereis opesta</i>	<i>Cytheridella ilosvayi</i>	<i>Darwinula stevensoni</i>	Time Interval Studied (ka BP)	Reference
1	Laguna Petenxil, Guatemala		x			4-0	Goulden 1966
2	Laguna de Cocos, Belize	x		x	x	5.93-0	Bradbury et al., 1991
3	Cobweb Swamp, Belize			x		7-0	Alcala-Herrera et al., 1994
4	Chichancanab, México	x?				7.6-0	Hodell et al., 1995
5	Punta Laguna, México			x		3.31-0	Curtis et al., 1996
6	Laguna Cobá, México	x?				7.6-0	Whitmore et al., 1996
7	Lago Petén Itzá, Guatemala			x		9.12-0	Curtis et al., 1998
8	Wallywash Great Pond, Jamaica			x	x	12.5-0	Holmes 1998
9	Salpetén, Guatemala	x				4-0	Rosenmeier et al., 2002a
10	Salpetén, Lago Petén Itzá, Guatemala	x	x	x		8.78-0	Rosenmeier et al., 2002b
11	Lago Petén Itzá, Guatemala		x			11.25-0	Hillesheim et al., 2005
12	Xcaamal, México				x	2.6-0	Hodell et al., 2005
13	Little Salt Spring, United States of America			x	x	12-0	Álvarez-Zarikian et al., 2005

14	Cenote Aktun ha, México			x	x	6.94-0	Gabriel et al., 2009
15	Lago Petén Itzá, Guatemala			x		43-0	Escobar et al., 2010
16	Lago Petén Itzá, Guatemala	x	x	x		5.25-0	Pérez et al., 2010
17	Lago Petén Itzá, Guatemala	x	x		x	24-10	Pérez et al., 2011
18	Lago Petén Itzá, Guatemala		x			43-0	Escobar et al., 2012
19	Laguna Tuspán, Guatemala		x	x	x	5.3-0	Fleury et al., 2014

## References

Alcala-Herrera, J.A., J.S. Jacob, M. L. Machain Castillo, & R. W. Neck. 1994. Holocene Palaeosalinity in a Maya Wetland, Belize, Inferred from the Microfaunal Assemblage. *Quaternary Research* 41: 121-130.

Álvarez Zarikian, C.A., P. K. Swart, J.A. Gifford & P. L. Blackwelder. 2005. Holocene paleohydrology of Little Salt Spring, Florida, based on ostracod assemblages and stable isotopes. *Palaeogeography, palaeoclimatology, palaeoecology* 225: 134-156

Bradbury, J.P., R.M. Forester, W. Bryant & A. P. Covich. 1991. Paleolimnology of Laguna de Cocos, Albion Island, Rio Hondo, Belize. *Ancient Maya Wetland Agriculture, Excavations on Albion Island, Northern Belize*. Westview Press. 119-154.

Cohuo, S., L. Macario-González, L. Pérez, F. Sylvestre, C. Paillès, J. Curtis, S. Kutterolf, M. Wojewódka, E. Zawisza, K. Szeroczyńska & A. Schwalb. Ultrastructure and aquatic community response to Heinrich Stadial (HS5a-HS1) in the continental northern Neotropics. Quaternary science review, submitted.

Curtis, J., D. Hodell & M. Brenner. 1996. Climate variability on the Yucatan Peninsula (Mexico) during the Past 3500 years, and implications for maya cultural evolution. Quaternary Research 46: 37-47.

Curtis, J., M. Brenner, D. Hodell, R. Balsler, G. Islebe & H. Hooghiemstra. 1998. A multi proxy study of Holocene environmental change in the maya lowlands of Peten, Guatemala. Journal of Paleolimnology 19: 139-159.

Escobar, J., Curtis, J., Brenner, M., Hodell, D.A., Holmes, J., 2010. Isotope measurement of ostracod and gastropod shells for climate reconstruction: evaluation of within-sample variability and determination of optimum sample size. J. Paleolimnol. 43 (4), 921e938.

Escobar, J., D.A. Hodell, M. Brenner, J.H. Curtis, A. Gilli, A.D. Mueller, F.S. Anselmetti, D. Ariztegui, D.A. Grzesik, L. Pérez, A. Schwalb & T.P. Guilderson, 2012. A ~43ka record of paleoenvironmental change in the Central American lowlands inferred from stable isotopes of lacustrine ostracods. Quaternary Science Reviews 37: 92–104.

Fleury, S., B. Malaizé, J. Giraudeau, D. Galop, V. Bout-Roumazielles, P. Martinez, K. Charlier, P. Carbonel, M. Arnauld, 2014. Impacts of Mayan land use on Laguna Tuspán watershed (Petén, Guatemala) as seen through clay and ostracode analysis, *Journal of Archaeological Science* 49: 372-382.

Gabriel, J., E. Reinhard, M.C Peros, 2009. Palaeoenvironmental evolution of Cenote Aktun Ha (Carwash) on the Yucatan Peninsula, Mexico and its response to Holocene sea-level rise. *Journal of Paleolimnology* 42:199–213.

Goulden, C. E. 1966. "The history of Laguna de Petenxil: The animal microfossils" *Acad. Arts Sci. Mem.*,17: 84-120.

Hillesheim, M., D. Hodell, B. Leyden, M. Brenner, J. Curtis, F. Anselmetti, D. Ariztegui, D. Buck, T. Guilderson, M. Rosenmeier & D. Schnurrenberg. 2005. Climate change in lowland Central America during the late deglacial and early Holocene. *Journal of Quaternary Science* 20 (4): 363-376.

Hodell, D. A., Curtis, J.H. & Brenner, M. 1995. Possible role of climate in the collapse of Classic Maya civilization. *Nature* 375:391-394.

Hodell, D., M. Brenner & J. Curtis, 2005. Terminal Classic drought in the northern Maya lowlands inferred from multiple sediment cores in Lake Chichancanab (Mexico). *Quaternary Science Reviews* 24: 1413–1427.

Holmes, J. 1998. A late Quaternary ostracod record from Wallywash Great Pond, a Jamaican marl lake. *Journal of Paleolimnology* 19: 115-128.

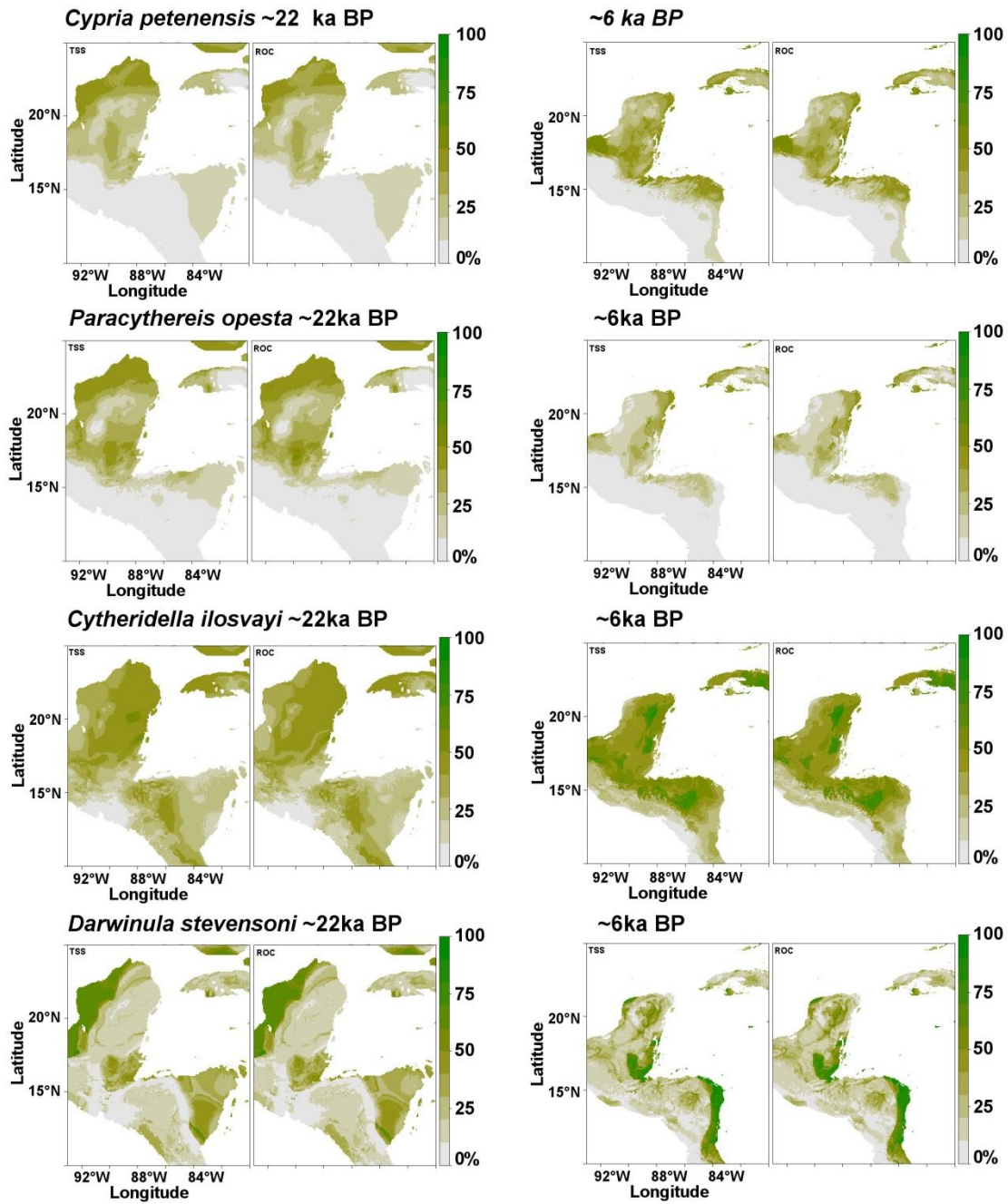
Pérez, L., J. Lorenschat, M. Brenner, B. Scharf & A. Schwalb, 2010. Extant freshwater ostracodes (Crustacea: Ostracoda) from Lago Petén Itzá, Guatemala. *Revista de Biología Tropical* 58: 871–895.

Pérez, L., P. Frenzel, M. Brenner, J. Escobar, P. Hoelzmann, B. Scharf & A. Schwalb, 2011. Late Quaternary (24~10 ka BP) environmental history of the Neotropical lowlands inferred from ostracodes in sediments of Lago Petén Itzá, Guatemala. *Journal of Paleolimnology* 46: 59–74.

Rosenmeier, M., D. Hodell, M. Brenner & J. Curtis. 2002a. A 4000 year lacustrine record of environmental change in the southern maya lowlands, Petén, Guatemala. *Quaternary Research* 57: 183-190.

Rosenmeier, M., D. Hodell, M. Brenner, J. Curtis, J. Martin, F. Anselmetti, D. Ariztegui & T. Guilderson. 2002b. Influence of vegetation change on watershed hydrology: implications for paleoclimatic interpretation of lacustrine d18O records. *Journal of Paleolimnology* 27: 117-131.

Whitmore, T. J., M. Brenner, J. H. Curtis, B. H. Dahlin & B. W. Leyden. 1996. Holocene climatic and human influences on lakes of the Yucatán Península, Mexico: an interdisciplinary paleolimnological approach. *The Holocene* 6 (3): 273-287.



**Figure S1.** Species distribution models of endemic *Cypria petenensis*, *Paracythereis opesta* and non-endemic *Cytheridella ilosvayi*, *Darwinula stevensoni*. Models are based on downscaled and calibrated climatic information of the MIROC-GSM climatic model for the period of ~22 and ~6 ka BP. Models performance were assessed with true skill statistic (TSS) and area under the receiver operating curve (ROC).