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Modern Ostracodes from Aquatic Habitats of Yucatán Península (Guatemala, Mexico and Belize) as Indicators of Climate and Environmental Change

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The tropics are one of the most important drivers of global climate. The Yucatán Península is located in the northern lowland Neotropics (Guatemala, Belize and Mexico) and is surrounded by the Gulf of Mexico and the Caribbean Sea. Its abundant aquatic environments and long history of human occupation make it an ideal research target to study the interaction between climate and human history. The aim of our project is to use ostracodes as indicators of past environmental and climate change. This will be possible by (1) making a sweeping overview of the taxonomic composition and the ecological valences of modern species along a N-S climatic gradient across the Península and (2) using this information for the interpretation of species assemblages from long cores retrieved from Lake Petén Itzá, Guatemala, during ICDP drilling in 2006. Long cores from the deepest (165 m) and oldest lake of the region, encompass the lake history of the past $\sim$ 85 kyrs.

Surface sediments and littoral samples from 18 lakes located between (N 15˚27' and 20˚39' and W 89˚06' and 89˚13') contain 18 species of ostracodes. We found benthic species such as *Cytheridella ilosvayi*, *Cyprideis* spp, *Darwinula stevensoni*, *Fabaeformiscandona* sp, *Limnocythere* sp and *Perissocytheridea* sp, and the nektic species are *Cypridopsis okeechobei*, *Eucypris* sp, *Heterocypris* sp, *Physocypria globula*, *P. pustulosa*, *P. xanabanica*, *Stenocypris* sp, *Strandesia* sp and *Thalassocypria* sp. We

have not yet found living *Cypretta* sp and *Potamocypris* sp. And thus are not able to conclude whether they are nektic or benthic species.

The assemblages of ostracodes are controlled by sulfate, hydrogen carbonate and chloride content as well as sediment geochemistry, saltwater intrusion, temperature and other physico-chemical parameters of their aquatic habitats. *C. ilosvayi* was collected from lakes with water temperatures ranging between 25.9 and 29.2 ˚C. *C. ilosvayi* was found to tolerate slightly saline environments and *P. globula* was collected from calm and permanent freshwater. *Potamocypris* sp was only found in Lake Yalahau, located in the dry northwest of Yucatán Península ($\sim$ 450 mm/yr of precipitation). *Stenocypris* sp shows preference for waters with low conductivity of max. 215 μScm^{-1} and oxygen concentration of max. 7.6 mgL^{-1}. A typical brackish water ostracode fauna is composed of *Cyprideis* spp, *Perissocytheridea* sp and *Thalassocypria* sp. Species with high hydrochemical tolerance and wide distribution are *C. okeechobei*, *Fabaeformiscandona* sp, *D. stevensoni* and *C. ilosvayi*. Sediment surface samples taken from a N-S transect in Lake Petén Itzá show higher abundance and diversity of ostracodes to a max. depth of $\sim$ 40 m. Ostracode assemblages and geochemical signatures from short cores sediments retrieved at 10 m and 40 m water depth display at around 1940 A.D and after 1970 A.D. high diversities that correlate with nutrient enrichment as a result of deforestation effects and increased population growth. This shows how species assemblages were affected by human impact during the recent past.