

Paper Number: 4230

## Climatic variability in western Mexico during Holocene (10,000 BP) interpreted from diatom and pollen record in sediment from Lake Chapala. (CHAPHOLO Project, Conacyt Grant 168685).

Israde-Alcántara I.<sup>2</sup>, Domínguez Vázquez G.<sup>2</sup>, Zárate-del Valle P.F.<sup>1</sup>, Doërfler W.<sup>3</sup>, Unkel I.<sup>3</sup>, Espinoza-Encinas I.R.<sup>4</sup>, Nelle O.<sup>5</sup>

<sup>1</sup>University of Guadalajara-Chemistry Department. Guadalajara. 44430 Mexico. [zavp.pvaz@gmail.com](mailto:zavp.pvaz@gmail.com)

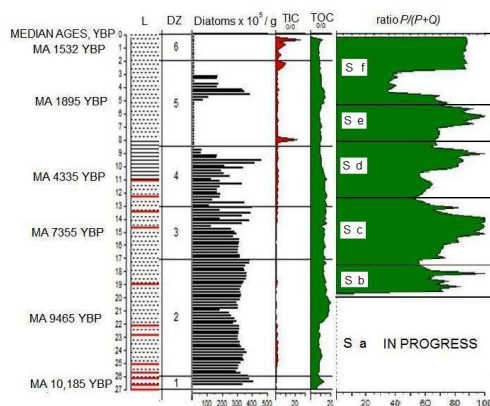
<sup>2</sup>University Michoacana. Morelia. 58000 Mexico

<sup>3</sup>Christian Albrechts University. Kiel, 24118, Germany

<sup>4</sup>National Autonomous University of Mexico. Mexico City. 04510 Mexico

<sup>5</sup>State Office for Cultural Heritage. Hemmenhofen, D-78343, Germany

THE LAKE. Based in the diatom record association are defined next six zones (Fig. 1): Zone 1 (Bottom: 26 to 27m), median age (MA) 10,185 years Before Present (BP): *Stephanodiscus niagarae* is the dominant taxa, indicating the deepest and diluted conditions along the core with effective moisture (major transgressive phase). Zone 2 (26 to 17 m), MA 9465 BP: Is characterized by *Aulacoseira granulata* interrupted by *Cyclotella aff. Kuetzingiana* as subdominant taxa indicating an increase in ionic conditions and turbidity in lake as result of a decrease in lacustrine levels. Zone 3 (17 to 13 m), MA 7355 YBP: Is dominated by *C. aff. kuetzingiana*, a peak in *S.niagarae* at 12 m (ca. 5000 BP) suggests an increase in humid conditions. Zone 4 (13 t 8.5 m), MA 4335 BP: Is characterized by *Stephanodiscus medius* alternating with *Surirella ovalis* indicating very fluctuant conditions. Zone 5 (8.5 to 2 m), MA 1895 BP:



Mark the establishment of modern conditions until present, with a peak in *S. ovalis* in coincidence with the high *A. granulata*, indicating low lake, saline, turbid and more extreme conditions at the base and top of this interval dominated by shrubs and herbs indicating an open vegetation landscape. *Cyclostephanus aff. dubius* and the little *S. medius* are recorded until late Holocene in the lake. Zone 6 (2 to 0 m), MA 1532 BP: *S. medius*, *C. aff. dubius*, periphytic diatoms (<5%), and *A. granulata* and *S. ovalis*, are observed in concordance with a return of saline conditions of the lake, indicate a regressive phase.

Figure 1: Diatom zones (DZ), scenarios (S), ratio P/(P+Q), lithology (L), percent TIC & TOC content in Lake Chapala sediments.

THE LANDSCAPE. Holocene landscape in the Chapala area can be divided preliminary in six different scenarios (S) that growly correspond to six diatom zones as follows (Fig. 1): in S b (19.6-17.8 m) the correlation observed between *Pinus* (P) and *Quercus* (Q) along the Holocene is lost, because pollen of *Quercus* increased and *Pinus* pollen decreased. This change in the pattern P/Q could be related to human activities and the forest structure has been affected; during S c (17.8-12.4 m) warm and wet conditions increase in the area, favoring the production of pollen from tropical taxa like *Celtis*, *Ficus*,

Myrtaceae, Solanaceae and *Cyperus*; in S d (12.4-8.4 m) strong disturbance is observed, where the pollen of arboreal taxa decreased, increasing the pollen of herbs; In S e (8.4-5.4 m) pollen of *Pinus* and *Quercus* decreased increasing the pollen of herbs like Asteraceae, Poaceae; S f (5.4-0.2 m) is related to humid and cold conditions that allowed the development of an open temperate forest. The ratio  $P/(P+Q)$  related to dryness was calculated, and five peaks were observed, where pine pollen dominates over *Quercus* pollen. All the peaks in the ratio  $P/(P+Q)$  (Fig. 1) corresponded to a decrease in the pollen of the arboreal elements except for the first one, observed in the base of the pollen record. This can indicate cold and wet conditions that favored the existence of a closed temperate forest with *Pinus*, *Quercus*, *Alnus* and Cupresaceae.

