



Martínez Lopez, A., Irela G. Álvarez-Gómez & R. Durazo (2012). Climate variability and silicoflagellate fluxes in Alfonso Basin (southern Gulf of California). *Botanica Marina*, 55(2): 177-185. DOI: 10.1515/bot-2012-0101

Climate variability and silicoflagellate fluxes in Alfonso Basin (southern Gulf of California)

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We conducted a study from January 2002 to February 2008 on silicoflagellate fluxes in Alfonso Basin at the entrance to the Gulf of California. Thirteen taxa were identified in sediment trap samples, with *Octactis pulchra* as the dominant species. Total flux climatology reached a maximum value of 5×10^6 skeletons $\text{m}^{-2} \text{day}^{-1}$ in December and then sharply decreased to a minimum value in February (2.3×10^3 skeletons $\text{m}^{-2} \text{day}^{-1}$) concurrently with the climatological sea surface temperature (SST) minimum. Subsequently, there was a positive trend with a second relative maximum of 1.6×10^6 skeletons $\text{m}^{-2} \text{day}^{-1}$ in September coincident with a maximum in climatological SST. During this period, there was a similar increase to 1.4×10^6 skeletons $\text{m}^{-2} \text{day}^{-1}$ in May. Factor analysis identified three patterns of variation: “subtropical oceanic,” “subarctic,” and “equatorial El Niño.” Factors had reasonable correlations with the Pacific decadal oscillation (PDO), North Pacific Gyre oscillation (NPGO), and El Niño Modoki indices ($r=0.53$, 0.67 , and 0.63 , respectively). The first and second modes were apparently linked to decadal climatic conditions correlated to PDO and NPGO, as suggested by the silicoflagellate species *Dictyocha messanensis* forma *messanensis* and the assemblage of *D. epiodon* and *Distephanus speculum*, respectively; the third mode was related to the presence of warm equatorial-oceanic waters identified by *D. messanensis* forma *spinosa*, which defines El Niño influence. These results demonstrate the importance of the region where there is a confluence of the low-frequency, high-latitude PDO, NPGO, and high-frequency El Niño signals.

Palabras clave: interannual variability, Gulf of California, silicoflagellates, climate variability, seasonal pattern, subtropical region

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