

FLYING DIATOMS - A KEY TO THE PATH AND ORIGIN OF A DUST STORM

Juliane Fenner¹, G. Houben¹, S. Kaufhold¹, H. Lechner-Wiens², F. Adam³ & J. Baez⁴

¹BGR

²Consulting, Asuncion, Paraguay

³Universidad Catolica

⁴DINAC-Meteorological Survey of Paraguay

Particles of a dust storm hitting Asuncion, Paraguay on 04.04.2009 were investigated. The dust was rich in amorphous silica. Microscopic analysis showed, it was remains and fragments of silica secreted by diatoms, sponges, as well as sedges, reeds, and grasses.

The diatoms are well preserved and practically unbroken, and in most cases occurred still combined to frustules. In chain-building species the frustules occurred still connected to chains.

All diatoms were freshwater diatoms. The majority of taxa among the diatoms belong to the genera *Pinnularia* and *Eunotia*. The most common species were *P. latevittata* Cleve, *P. major* Ehrb., *P. microstauron* (Ehrb.) Cleve, *P. divergens*, *P. streptoraphe* var. *parva* Krammer, and *E. zygodon*, Ehrb., *E. glacialis*, *E. didyma* Grun. var. *didyma*. Other characteristic but more rarely present species are *Rhopalodia rupestris* var., *Stauroneis phoenicenteron*, different species of the genus *Nitzschia*, *Staurosira* cf. *pinnata*, *Staurosira* sp., *Frustulia rhomboides*, *Diploneis* sp., *Encyonema* sp., *Epithemia* sp., *Diadesmis* sp., *Caloneis* sp., and a few frustules and chains of one species of the genus *Aulacosira* sp..

Some of the diatom species are characterized by large frustules, e.g., the relatively common *Pinnularia latevittata* (160 - 230 µm), *P. major* (>300 µm), and *Eunotia glacialis* (170 – 230 µm) are most prominent because of their size. Other large but more rare frustules were those of *Surirella rumrichorum* (>300 µm) and species of the genus *Nitzschia*.

The diatom association is characteristic for the neotropics and neosubtropics of South America, an oligotrophic, silica-rich shallow water body of low electrolytic level. This together with the lack of minerogenic detritus and abundance of plant detritus suggests a large swamp area as the source.

Such swamp lands occur in the lowlands along the Rio Paraguay. At the end of the very dry summer 2008/9 these swamps had fallen dry, and the area had fallen victim to wild fires. A storm created by the convergence of a cold front with warm tropical air created a storm, which picked up these burnt swamp relicts.