



Climate Changes Inferred from Pollen Record of Recent 3000 years in Sonluo Lake, Northeastern Taiwan

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Palynological studies can detect the impact of rapid climate changes on terrestrial ecosystems, since vegetation variation in response to climate fluctuation can occur on the order of decades. In this study, we provide a new pollen record from Sonluo Lake and intend to discover the relationship between winter monsoon and climate conditions of northeastern Taiwan during the recent 3000 years.

Sonluo Lake, at an elevation of 1300 m AMSL, is an isolated basin located in Shueshan Range, northeastern Taiwan. Annual precipitation is approximately 4,400 mm, and almost occurs evenly through one year. Vegetation surrounding the basin is of the Machilus-Castanopsis vegetation type and lower Quercus vegetation type.

Four climatic phases are determined with the aid of palynological studies. During the interval 3000 to 2200 yr BP (Zone IV), abundant pollens of Tsuga and fern spores indicate that the climate conditions were cool and wet than present. Subsequently, the warm climate conditions prevailed between 2200 and 1500 yr BP (Zone III) as suggested by the decline of Tsuga. From 1500 to 700 yr BP (Zone II), the lowest percentage of Tsuga and fern spores indicates a warmest and driest period. Following that, the basin experienced again cool and wet climate conditions since 700 yr BP, evidenced by the return of Tsuga and fern spore. The last climatic phases can be corresponded to the Little Ice Age. The high correlation ($R=0.73$) between pollen of Tsuga and fern spores indicates that winter monsoon dominant condition in this region.