Late Aptian (Cretaceous) dry – wet cycles and their effects on vegetation in the South Atlantic: palynological evidences

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The Cretaceous is generally conceived as one the warmest periods in Earth history. However, the climatic effects on vegetation are poorly documented. The link between warm climate and plant distribution is here highlighted on the basis of palynological analyses. An upper Aptian well section from the Sergipe Basin in north-eastern Brazil documents four cycles of dry–wet oscillations, based on palynological evidences. The cycles show a general trend of acceleration of the hydrological cycle. The dry periods are recorded mainly at the base of the section, with changes to more humid periods upwards. The dry periods are characterized by high to very high abundance of *Classopollis classoides*. Already in the wet periods a conspicuous change in vegetation is recorded, with an increase in ferns and mountain flora, in particular *Araucariacites australis*. The replacement of *Classopollis* by *Araucariacites* and ferns reflects a change from a dry to wet phase. The first dry–wet cycle (DWC-1) is recorded in the dominantly non-marine phase. At the base of this first cycle an intensive growth of anhydrite nodules is recorded. However, in beds overlying the evaporites, there is a conspicuous increase in the flora associated with humid condition (ferns and mountain flora). DWC-2 starts with a pronounced peak of dinoflagellate cysts, which decrease abruptly accompanied by an increase in xerophytic flora (e.g. *Classopollis classoides*). However, the abundance of xerophytic flora decreases upwards to give room for high abundances of fern spores, mountain flora (e.g. *Araucariacites australis*) and, in particular, dinoflagellate cysts. DWC-3 starts with a short interval containing a moderate abundance of xerophytes and a conspicuous wet flora and marine elements. With rising humidity, fern diversity also increased, suggesting that humidity was an important factor for the radiation of this group. DWC-4 records minor peaks of xerophytic flora and a dominance of fern spores and mountain flora. The change in flora may be the result of dislocation of the Intertropical Convergence Zone (ITCZ) and a relative sea-level rise.