Dinoflagellate cysts and Palynofacies across the Cretaceous/Paleogene boundary at the neritic Waidach section (Eastern Alps, Austria)

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In the area north of Salzburg (Austria), the Cretaceous/Paleogene boundary (K/Pg boundary) has been recognized in the neritic Waidach section (Helvetic thrust unit). The outcrop comprises calcareous nannoplankton Zone CC26 (Nephrolithus frequens Zone) of latest Cretaceous age (Gerhartsreit Formation) and part of the lowermost Paleocene Zone NP1 (Markalius inversus Zone) of the Olching Formation. The stratigraphic record across the K/Pg boundary is incomplete due to a minor fault. Well preserved and high diverse dinoflagellate assemblages of 36 samples are composed of a total of 163 dinocyst species and subspecies belonging to 62 genera. Dinoflagellate cysts do not show accelerated rates of extinction at the K/Pg boundary. The composition of the dinoflagellate assemblages, however, change drastically from Areoligera dominated assemblages in the Upper Maastrichtian to Hystrichosphaeridium dominated assemblages in the Upper Maastrichtian to Hystrichosphaeridium dominated assemblages in the Lower Danian. Two Manumiella spikes were recorded in the Upper Maastrichtian (~1 m and 10 m below the K/Pg boundary) and interpreted to reflect slight coolings of oceanic surface waters. In the lower Danian, Carpatella cornuta, Senoniumsphaera inornata and Damassadinium californicum have their first occurrences. An acme of Spongodinium delitiense (1 m above the K/Pg-boundary) indicates a decrease in paleoproductivity whilst the peridinioid/gonyaulacoid (P/G) ratio of all other samples suggests high paleoproductivity throughout the section. Moreover, this acme is interpreted as a transient cooling event of oceanic surface waters. Two palynofacies assemblages were distinguished indicating shelf to basin transitions and dysoxic to anoxic conditions.