

Abstract. Mesozoic–Cenozoic organic-walled dinoflagellate cyst (dinocyst) biostratigraphy is a crucial tool for relative and numerical age control in complex ancient sedimentary systems. However, stratigraphic ranges of dinocysts are found to be strongly diachronous geographically. A global compilation of state-of-the-art calibrated regional stratigraphic ranges could assist in quantifying regional differences and evaluate underlying causes. DINOSTRAT (Bijl, 2023a; Bijl, 2023b) is an open source, iterative, community-fed database intended to house all regional chronostratigraphic calibrations of dinocyst events. DINOSTRAT version 2.0-GTS2020 includes >9,450 entries of first and last occurrences (collectively called “events”) of >2,040 dinocyst taxa, and their absolute ties are now updated to the chronostratigraphic timescale of Gradstein et al., 2020. Entries are derived from 211 publications and 209 sedimentary sections. DINOSTRAT interpolates paleolatitudes of regional dinocyst events, allowing evaluation of the paleolatitudinal variability of dinocyst event ages. DINOSTRAT allows for open accessibility and searchability, on region, age, and taxon. This paper presents a selection of the data in DINOSTRAT: (1) the (paleo)latitudinal spread and evolutionary history of modern dinocyst species; (2) the evolutionary patterns and paleolatitudinal spread of dinocyst (sub)families; (3) a selection of key dinocyst events which are particularly synchronous. Although several dinocysts show – at the resolution of their calibration – quasi-synchronous event ages, indeed many species have remarkable diachroneity. DINOSTRAT provides the data storage approach by which the community can now start to relate diachroneity to (1) inadequate tie to chronostratigraphic timescales; (2) complications in taxonomic concepts and (3) ocean connectivity and/or the affinities of taxa to environmental conditions.