Integrated bio- and carbon isotope stratigraphy in the Fars and Lurestan zones in Zagros (Iran) leave clues to syntectonic sedimentation and uplifting/subsiding phases of a Foreland Basin

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The Campanian-Danian sequences of the Gurpi Formation of two stratigraphic sections in two different localities of the Zagros Basin (Fars and Lurestan Zone) were studied for integrated bio- and carbon isotope stratigraphy. Calcareous nannofossils, planktic foraminifera, high-resolution carbon and oxygen stable isotopes and correlation to European reference sections led us to build a solid age model for the two sections. Despite the consistency of the obtained data between the two sections, major differences are observed in sediment accumulation rates and facies variation of the two different areas. The Gandab section, located in the Lurestan zone (northern Zagros), consists of marl and marly limestones, a member of indurated whitish argillaceous limestone (Emam Hasan member), and a member of shallow marine limestone, including macrofauna (Seymareh member). Shahneshin, located in the Fars province (central Zagros), consists of monotonous marl and marly limestone. The Gandab section has a relatively higher sedimentation rate than Shahneshin and shows continuous reworking of calcareous nannofossils throughout the Campanian up to the Danian interval.

The biostratigraphy data and the field observations in the northeasterly areas of Lurestan point to even more facies variation and prominent reworking, which is linked to tectonic activities during the Late Cretaceous-Paleogene of the Zagros Basin. According to our results and the known distribution of facies across the SW-NE transect of Lurestan, a schematic model of syntectonic sedimentation and facies distribution has been drawn. Our model illustrates how the Neo-Tethys' continental convergence and closure resulted in uplifting/subsiding of the basin floor, shifting the depocenter, resulting in significant changes in sedimentary facies, and intense reworking phenomena in the Lurestan region.