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Editorial

Editorial for Special Issue "Linking Tectonic Setting to Sedimentological and Stratigraphic Variability"

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The stratigraphic evolution of sedimentary basins reveals (1) the spatial and temporal development of depositional settings; (2) the geotectonic settings; (3) the climatic conditions. Stratigraphy and sequence stratigraphy have applications in evaluating the basin-forming mechanisms, such as subduction-driven, orogenic, and rifting processes with industrial significance. Despite the documented deviations in different parts of the same basin, the sedimentary fill of basins is sometimes comparable between basins situated in similar geotectonic settings. Sedimentological and stratigraphic evolution arguably display significant variability in different geotectonic settings.

The papers in this Special Issue utilise wide-ranging multidisciplinary datasets (including stratigraphic, structural, and geophysical datasets) to describe the development and hydrocarbon potential of the Adriatic region, with emphasis on the central and northern parts of the area. Yasir et al. (2022) [1] present field and petrographic data, along with physical and strength parameters of selected intrusive rocks from northern Pakistan, revealing the weathering grade and its correlation with physical properties and strength. The results indicate that the rock strength reduces with increasing weathering grade and composition change (from mafic to felsic). Further, despite the confirmation that quartz affects rock strength, no significant link was documented between rock strength and the maximum and mean grain sizes of other minerals. Alvarenga et al. (2021) [2] propose a stratigraphic framework of the rift section of the inner offshore part of the Campos Basin, based on seismic sequence stratigraphic concepts that stem from systematic analysis of 2D seismic profiles. In contrast with the general scenario, in which rudstones are developed at structural highs, the data suggest that large rudstone bodies may be present in depocenters and deeper zones of the troughs. The proposed new petroleum play may be applicable not only for the Campos Basin, but could also be extended to the neighbouring Santos and Espírito Santo basins. Bourli et al. (2021) [3] provide a detailed description of the depositional environments within the carbonate Mesozoic succession of the Ionian Basin, in the external sub-basin (Kastos Island) and the internal sub-basin (Araxos peninsula), respectively. The microfacies analysis suggests that the Cretaceous deposits record different depositional conditions in the two studied areas. Kastos Island was characterised by deeper, more stable conditions and likely represents the deeper parts of the external Ionian sub-basin. On the other hand, the Araxos peninsula is situated in the western margins of the external Ionian sub-basin, where shallower depositional conditions occurred. Further, the integration of field data microfacies analysis and age determination led to the reconstruction of the regional geological map of Kastos Island. Sivalneva et al. (2021) [4] summarise the results obtained from detailed petrologic investigations from a new C-C-1 well in the southwestern part of the Siljan Ring, Central Sweden. These results led to the development of lithological and petrographic columns with descriptions of alteration processes, such as fracturing and mineralisation. The results assisted the definition of the potential reservoir intervals throughout the sedimentary and basement sections. Additionally, the data allow us to reevaluate the structure of the Paleozoic sedimentary succession and reservoirs in the basement rocks. These findings are particularly valuable for stratigraphy refinement and tectonic setting reconstructions, as well as oil and gas reservoir forecasts. Melehan et al. (2021) [5] integrates

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sedimentological and stratigraphic insights into the Upper Permian sedimentary rocks of the Wittingham, Tomago and Newcastle Coal Measures in the Northern Sydney Basin, Australia, to shed light on the involved depositional environments and sub-environments, as well as to document the sequence-stratigraphic framework. The data suggest a shallowing upward trend, which is reflected by fluvial deposits sitting on top of the deltaic deposits. In sequence stratigraphic terms, the deltaic system accumulated during highstand normal regression, while the deposition of the overlying fluvial system occurred during lowstand normal regression. The two systems are separated by a subaerial unconformity developed during an intervening forced regression. Short periods of transgression are inferred from the presence of higher-frequency cycles in the delta front. Preiss-Daimler et al. (2021) [6] offer a review and assessment of the middle-to-late Miocene Carbonate Crash events in the low to mid latitudes of the Pacific, Indian, Caribbean and Atlantic Oceans. These events are part of the global palaeoceanographic reorganisations between 12 and 9 Ma, and the paper emphasises record preservation and their relation to mass accumulation rates. The results of the study suggest that the carbonate crash events mark a period of major perturbations in the marine carbonate system that is ascribed to several steps in the reorganisation of global deep and intermediate water circulation. These steps also influenced (in both time and space) the various parts of the global ocean basins. By reviewing and comparing the eastern equatorial records, the authors proved that alternating El Niño/La Niña-like states influenced both opal and carbonate accumulation in the Eastern Equatorial Pacific on the California margin and off Peru. Marriott and Chamberlain (2021) [7] provide a revised approach to the implementation of incomplete Ammonite Sutures as markers of sutural complexity. The revised (LLS) approach employs only the lateral lobe and second saddle S2 (lateral lobe–second saddle pairs) that lie in the central, mid-whorl undistorted sector of a suture line as viewed in lateral, profile shell photos and illustrations. The method requires no full hemisuture and facilitates comparisons among sutures within an ontogenetic sequence, or sutures from multiple ammonite taxa where ventral and umbilical sutural elements are hidden by whorl overlap or poor preservation.

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