



Geological inheritance as a control on cala development

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Calas are characteristic embayed rocky coastline landforms related to steep-sided drowned valleys that were deeply incised during low sea-level stages into carbonate plateaus driven by the structural control. Karst collapse dolines, and valley infilling associated with Quaternary sea-level oscillations are also important in shaping and sizing calas. Fairly extensive literature on calas has concentrated in the Mediterranean basin whereas calas are rock coast macroforms present in many other geographical domains. Exploring the nature of non-Mediterranean calas it is possible to unravel the processes participating in cala formation and evolution, as well as improve the knowledge of the different mechanisms and process that shape this rock coast macro-form.

This study compares the rock coast macro-forms from the carbonate rocky coast of Victoria (Australia) and the rock coast of the Balearic Islands by means of classical geomorphological description and cala morphometric characterization. Results show that, despite similar rock properties, terrain slope, and fractures or joint patterns, or glacioeustatic sea-level history with the Mediterranean basin, very few “classical” calas appear at the Victoria carbonate coast despite there is a large number of structural-karstic controlled embayments, arches, and stacks that resembles the rock coast macro-forms from the Balearic Islands. The major differences between the calas development and mature, once discarded the differences regarding to rock control, fracture patterns and Quaternary sea-level history, are related to the contribution of geological inheritance in terms of the imprint of particular geological events such as the Mediterranean Salinity Crisis. This is a quite distinctive event between the study areas and contribute to explain why the carbonate plateau incision is deeper in the Mediterranean basin (promoting the development and mature of calas) in comparison with the southern coast of Australia that has not experienced such base level fall, and where marine erosion and karst development are more important than the plateau incision. Therefore another factor should be introduced in the calas controls and components: the geological inheritance.

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