

Pirambóia Formation eolian depositional system reconstruction (Mesozoic), Rio Claro western (SP)

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Abstract

Eolian ergs usually are understood as exclusive hot or cold-climate arid system with eolian process. However, different processes are interacting, as subaqueous transport and deposition in ephemeral rivers, which was described in the outcrops on Rio Claro western, near Charqueada, SP. The interaction between different processes can be indicator of climatic changes, since the common eolian erg is an arid system, and the characteristics observed allow reconstruct paleoenvironment in terms of transport and deposition conditions and water presence.

Key words: Paraná Basin, desert/eolian depositional system, Pirambóia Formation.

Introduction

In desert system, ephemeral rivers may influence processes of erosion and transport, decreasing the availability and input of sediments, or even obliterating the deposition by the wind. Such interaction can form unique deposits, with textural characteristics of eolian deposits, but sedimentary structures derived from subaqueous transport. Since the common eolian erg is an arid system, the presence of fluvial deposit demonstrate climate changes to a semi-arid or humid, resulting in a completely change of depositional system and environment.

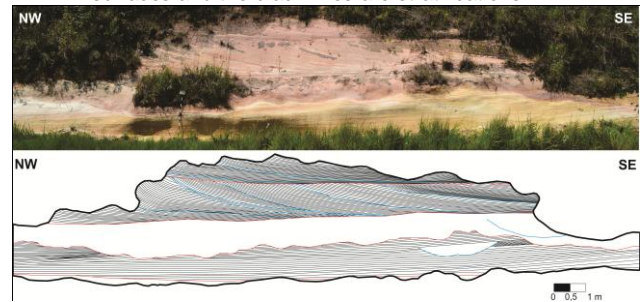
Pirambóia Formation (Mesozoic) is reported as related to Guará Formation at Brazil southern¹, a fluvial-eolian succession. The outcrops described near Charqueada, SP, present three distinct facies that represent three different deposition processes and the research purpose reconstruct the depositional system with observations and interpretation of their characteristics.

Results and Discussion

As reported previously, three distinct facies was described. The basal facies represent a bed composed constituted of very fine- to medium-grained sand, showing bimodal distribution of the grain size and wind-ripple dominance as pinstripe lamination, which could be corresponding to a dry interdune or base of dune. This facies is superimposed by an erosive surface and subaqueous facies, composed by coarse-grained sand with fine-grained sand intraclasts. The upper surface of this subaqueous deposits shows, in section, tapering downwards fractures filled with medium to fine sand, which on the bed surfaces should corresponds to polygonal fractures, indicating a long period of non-deposition. An erosion surface is observed between subaqueous deposit and superimposed bed, and this bed consist in a coset of trough cross-bedding, as

consequence of repeated and ongoing sedimentation whereby ripple, avalanche and grainfall strata, characteristic of eolian dunes, with reactivation surfaces.

Image 1 – General appearance of outcrop and sketch, the red lines are erosion surfaces, blue lines are reactivation surfaces and the black lines are stratifications.



Conclusions

The described outcrop presents a basal eolian deposit, a subaqueous facies on middle section, related to fluvial deposit and another eolian deposit at the top of section. This sedimentary sequence indicates a change from a desert system to fluvial system and after a period, back to desert system, which corresponds to variation in the moisture conditions. The variation of water presence represents rainier climatic conditions when the fluvial system dominates and driest conditions when the desert system dominates. Therefore, Pirambóia Formation could be organized in fluvial-eolian cyclic system as proposed to Guará Formation.

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¹ Scherer, C. M.S.; Lavina, E.L.C. Sedimentary cycles and facies architecture of Aeolian-fluvial strata of the Upper Jurassic Guará Formation, southern Brazil. *Sedimentology*. 2005, 52, 1323-1341..