



Exhumation history of the Serra do Mar, southeast Brazil

Marli Carina Siqueira-Ribeiro (1), Peter Hackspacher (1), and Finlay M. Stuart (2)

(1) Instituto de Geociências e Ciências Exatas da Universidade Estadual Paulista- IGCE/UNESP, Rio Claro, Brasil. (marlicarina@gmail.com), (2) Isotope Geosciences Unit, Scottish Universities Environmental Research Centre, East Kilbride G75 0QF, UK. (fin.stuart@glasgow.ac.uk)

The Serra do Mar (SM) mountain range located along the southeast Brazilian continental margin is characterized by a low-lying coastal plateau separated from the elevated inland plateau by a steep escarpment. This morphology is a result of reactivation of Precambrian shear zones since the break-up of the Western Gondwana and opening of the South Atlantic Ocean in Early Cretaceous (1). Previous Thermochronological data from southeast Brazilian highlands (2,3), indicates that the landscape evolution is associated with several distinct exhumation events. In order to clarify the intensity and duration of the post-break up tectonic processes that shaped the SM we have undertaken a low temperature thermochronology study of crystalline basement, from the plateaus and escarpments situated between south of Rio de Janeiro and São Paulo state. Apatite fission track (AFT) and (U-Th/He) and (AHe) dating has been combined with geologic information to generate precise thermal histories and make initial attempts to quantify the amount of exhumation.

AFT ages range from 145 to 53 Ma whereas preliminary AHe ages range from 75 to 37 Ma. Forward modeling using QTQt confirms Late Cretaceous-Paleogene cooling identified earlier (4,5) and identifies a distinct cooling phase in Neogene, between 30 and 10 Ma. Neogene cooling rapid caused exhumation of rocks 1 km through of the crust mainly in south portion of the SM in Rio de Janeiro state.

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