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Extensional tectonics control on Quaternary drainage migration and sedimentation in the das Cinzas River Basin, Paraná state, Brazil.

Santos, M.[1], Batezelli, A.[2] and Nunes, J.O.[3], Ladeira, F.S.B[4]

[1]UNESP - Univ Estadual Paulista, Campus de Ourinhos, Vitalina Marcusso 1500, Ourinhos - SP, Brazil, dossantos.marcilene@gmail.com.
[2]UNICAMP – IG, abatezelli@ige.unicamp.br
[3]UNESP - Univ Estadual Paulista, FCT - Campus de Presidente Prudente, joaosvaldo@fct.unesp.br
[4]UNICAMP- IG, fsbladeira@ige.unicamp.br

The das Cinzas River Basin, located in the northern state of Paraná - Southern Brazil, lays in a typical geomorphological context of plateaus carved on sedimentary (siltstones, shales, diamictic, mudstones and sandstones) and magmatic rocks (basalts of the Serra Geral Fm.), associated to Paleozoic and Mesozoic formations of the intracratonic Paraná Basin, and Precambrian rocks in the upper das Cinzas River.

The structural framework of the Paraná Basin is formed by numerous dikes, shear zones, faults and fractures reactivated at shallow crust levels, specially between Upper Cretaceous and Paleogene / Neogene, which caused block tilting and the normal faulting such as described by Franco-Magalhães et al [1]. In the study area, the structural framework is given by inumerous diabase dykes, faults and lineaments associated to the northeastern edge of the Ponta Grossa Arch. Four structural patterns stand out in the area, NW-SE, NE-SW, ENE and NNW and the main patterns refer to NW-SE and ENE, representing reactivated discontinuities, which NW-SE trend is associated to diabase dikes.

This work investigates the morphogenesis of the das Cinzas River Basin, through integrated study on landforms, sedimentation, ancient weathering processes and neotectonics. For this purpose, are used geological, geomorphological and pedological methods and techniques, with emphasis on landforms, cenozoic sedimentary deposits, paleosols/buried soils and neotectonic features, including C14 dating and LOE techniques.

The results suggest that extensive individual faults or fault zones and fractures associated to numerous diabase dykes, developed or re-activated in the Mesozoic and Paleogene / Neogene, remained active in the Quaternary, controlling and modifying the drainage network and the associated sedimentation / erosion processes. The identification and analysis of polymictic gravel deposits of das Cinzas paleochannel and its main tributary, Laranjinha River, associated to changes in its meandering and migration pattern, as well as asymmetric alluvial plains and distinguished terrace levels associated to normal faults and fracture zones, several geological sections, topographic profiles, and C^{14} dating in sandy mud deposits indicate an extensional tectonic control on landforms and Quaternary sedimentation in the study area.

The framework involves synthetic and antithetical listric faults into *en echelon* faults arrangement which sole into a lowangle detachment fault, outlining grabens and narrow and elongated hemi-grabens towards NW to NNW in which occurred intensive Quaternary sedimentation, migration, avulsion and compression meanders, adjacent to horsts in which predominates the erosion. The general arrangement

seems to be given by several tilted and rotated blocks forming horsts and grabens/hemigrabens joined by relay ramps or complex transfer zones from one to another sector or between one and another adjacent fault, forming a complex extensional framework.

References:

[1] FRANCO-MAGALHÃES, A.O.B. et al. (2010) Revista Brasileira de Geociências 40 (2): 184-195