



Sediment routing system in the syn-orogenic series of the Corbières zone (Aquitaine Basin, France)

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Understanding the evolution of syn-orogenic sediment routing systems can improve our understanding of the development of the mountain belts. The North Pyrenean foreland basin evolved from underfilled to overfilled during Eocene time, contemporaneously with the development of the Pyrenean orogeny. The resulted syn-orogenic conglomerate series, known as “Poudingues de Palassou”, recorded the exhumation and the denudation of the mountain belt. Three tectono-sedimentary units with different facies characteristics, lateral extension and petrographic content have been identified in the Palassou series in the Corbières zone (east of the Aquitaine Basin): The first unit deposited during late Ypresian – Lutetian time is characterized by clasts from the Meso-Cenozoic regional sedimentary cover. The second unit deposited during Bartonian corresponds to clasts of magmatic and metamorphic origin (including granites). Clasts of the Meso-Cenozoic sedimentary cover characterizes again the third unit deposited during Priabonian time. However, clasts origins, transport modalities and the evolution of the source to sink system are poorly constrained. Identify the source(s) of deposited material, characterize the evolution the transfer zone i.e. the fluvial systems and the understanding of sediment dynamic production are the main goals of this study. Facies characterization of the three units and their association allow the determination of the corresponding depositional environment. For the three tectono-sedimentary units, depositional environments start with metric lacustrine deposits at the base of each unit, followed by fluvial deposits reflecting various depositional environment of metric to decametric size (alluvial fan deposits, braided rivers and wandering rivers). For example, depositional environment of the first unit starts with deltaic and lacustrine deposits and are followed by braided rivers and alluvial fan deposits. For units 2 and 3, lacustrine deposits at the base are followed by continental deposits reflecting distal and proximal braided rivers whose detailed description is in progress. Zircon U/Pb method is applied on granite boulders and matrix detrital sands for eight Eocene samples in order to identify the source of deposited materials. Optically clear zircons, inclusion-poor, intact crystals were hand-picked and analysed by LA-ICP-MS. Variscan ages ranging between 324 ± 1 and 335 ± 1 Ma are acquired for granite boulders from the unit 2 (5 samples). The results on one sample of granite boulders from the unit 3 identifies a broader origin with Variscan (290-360 Ma), Caledonian (440-490 Ma) and Cadomian (530-600 Ma) sources. For detrital samples, a strong Variscan source signal is again observed for the top of unit 1 (330-340 Ma) and the middle of unit 2 (310 Ma). The base of unit 2 has a clear Cadomian source (520-650 Ma) evidencing that clast origins have varied with time. Paleocurrent directions measured for samples of unit 2 are N-NW and are consistent with Pyrenean sources where Variscan ages may correspond to the exhumed basement rocks in the eastern Pyrenees, and Caledonian and Cadomian ages may correspond to recycled sedimentary Paleozoic rocks.

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