Geophysical Research Abstracts
Vol. 14, EGU2012-5359-1, 2012
EGU General Assembly 2012

Paleozoic-involving thrust array in the central Sierras Interiores (South Pyrenean Zone, Central Pyrenees): regional implications

L. Rodriguez, J. Cuevas, and J. M. Tubía

Universidad del País Vasco UPV/EHU, Facultad de Ciencia y Tecnología, Departamento de Geodinámica. ap. 644-48080 Bilbao. Spain (lidia.rodriguez@ehu.es)

This work deals with the structural evolution of the Sierras Interiores between the Tena and Aragon valleys. The Sierras Interiores is a WNW-trending mountain range that bounds the South Pyrenean Zone to the north and that is characterized by a thrust-fold system with a strong lithological control that places preferably decollements in Triassic evaporites. In the studied area of the Sierras Interiores Cenomanian limestones cover discordantly the Paleozoic rocks of the Axial Zone because there is a stratigraphic lacuna developed from Triassic to Late Cretaceous times. A simple lithostratigraphy of the study area is made up of Late Cenomanian to Early Campanian limestones with grey colour and massive aspect in landscape (170 m, Lower calcareous section), Campanian to Maastrichtian brown coloured sandstones (400-600 m, Marboré sandstones) and, finally, Paleocene light-coloured massive limestones (130-230 m), that often generate the higher topographic levels of the Sierras Interiores due to their greater resistance to erosion. Above the sedimentary sequence of the Sierras Interiores, the Jaca Basin flysch succession crops out discordantly.

Based on a detailed mapping of the studied area of the Sierras Interiores, together with well and structural data of the Jaca Basin (Lanaja, 1987; Rodríguez and Cuevas, 2008) we have constructed a 12 km long NS cross section, approximately parallel to the movement direction deduced for this region (Rodríguez et al., 2011). The main structure is a thrust array made up of at least four Paleozoic-involving thrusts (the deeper thrust system) of similar thickness in a probably piggyback sequence, some of which are blind thrusts that generate fold-propagation-folds in upper levels. The higher thrust of the thrust array crops out duplicating the lower calcareous section all over the Sierras Interiores. The emplacement of the deeper thrust system generated the tightness of previous structures: south directed piggyback duplexes (the upper thrust system) affecting the Marboré sandstones and the Paleocene limestones, deformed by angular south-vergent folds and their related axial plane foliation.

The transect explained above clearly summarizes the alpine evolution of northern part of the Sierras Interiores. Moreover, well data available indicate the presence of two thrust soled in the lower calcareous section covering Triassic evaporites at 5 km depth and 8 km to the south of the Sierras Interiores. Because the Triassic evaporites constitute a main decollement level in the South Pyrenean Zone, the deeper thrust system is associated to the emplacement of the Gavarnie nappe.

Lanaja, J.M., 1987, Contribución de la exploración petrolífera al conocimiento de la Geología de España, IGME, Madrid, 465 p.

Rodríguez, L., Cuevas, J., 2008. Geogaceta 44, 51-54.

Rodríguez, L., Cuevas, J., Tubia, J.M., 2011. Geophysical Research Abstracts 13, 2273.