Does the lithostratigraphic harmonization of the Beiras Group (Panasqueira-Segura area) disclose any pre-Ordovician structure?

A harmonização lito-estratigráfica do Grupo das Beiras (área de Panasqueira-Segura) revelará alguma estruturação ante-Ordovícica?

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Resumo: *A constituição/arquitetura do Grupo das Beiras (GB) é atribuível ao desenvolvimento de duas bacias sedimentares: uma Ediacárica, associada à formação de uma cintura back-arc na orogenia Cadomiana; outra, de idade Câmbrica, assente sobre uma discordância angular a que se associam níveis descontínuos de conglomerado poligénico matriz-suportado, possivelmente representando a base do Câmbrico (olistostromas de Fuentes/Membrillar) e o nascimento de um rift intra-continental. À escala regional, uma sequência detrítica rítmica cobre heterogeneamente as unidades inferiores do GB, denunciando dobramento das unidades Ediacáricas e basculamento de blocos durante eventos ante-Câmbricos ou do Câmbrico inicial. A harmonização litoestratigráfica realizada na área de Panasqueira-Segura indicia duas descontinuidades, uma intra-Cadomiana (Alcudiense) e outra do Câmbrico basal, consistente com o contraste geoquímico/isotópico exibido pelos sedimentos Câmbricos e Ediacáricos.*

Key words: *Ediacaran, early Cambrian, Cadomian orogeny, continental rifting, Gondwana*

Palavras-chave: Ediacárico, Câmbrico inicial, Orogenia Cadomiana, rifting continental, Gondwana

The pre-Ordovician Slate-Greywacke Complex (SGC) of the Central Iberian Zone (Sousa, 1984) includes a lower Ediacaran sedimentary record deposited in a Cadomian orogen back-arc basin to the north of Gondwana (Pereira et al. 2012). It is composed of two lithostratigraphic successions separated by the Alcudian unconformity defined in Spain (e.g. Ferreira da Silva 2013). On top, early Cambrian detrital, locally carbonated, sequences lay unconformably onto the folded and tilted Ediacaran strata. The stratigraphic discontinuity is outlined by a laterally discontinuous matrix-supported conglomerate (Fuentes and Membrillar olistostromes), bearing clasts (olistoliths) with magmatic arc signatures and fragments of Ediacaran limestones (Ugidos et al. 2020). Early Cambrian sequences in the CIZ are commonly ascribed to the birth of a fast-spreading passive margin developed in north-Gondwana, probably inheriting some of the previous Cadomian back-arc structures (Quesada & Oliveira, 2019).

Metasediment whole-rock geochemistry and isotopic data from the SGC of Spain and Portugal, have been successful in distinguishing the Cambrian and the Ediacaran strata (e.g. Ugidos et al. 2020), providing a reliable tool to identify sedimentary sources, recycling taxa, and to confine the basins' geodynamic settings. Geochemistry of the Ediacaran stratigraphic groups above and below the Alcudian unconformity present an identical signal of an active Cadomian magmatic arc located towards south, in Ossa Morena Zone. This is reinforced by geochronological data displaying a very high prevalence of 560-600 Ma detrital zircons in comparison to older populations (e.g. Pereira et al. 2012). The early Cambrian sequences (Terreneuvian-Series 2) show a dilution of the Cadomian magmatic arc geochemical and geochronological signals, pointing for a higher grade of sedimentary maturation, which can be related to the recycling of the underlying Ediacaran basement (surrounding highs) or by longer maturation in river systems (e.g Ugidos et al. 2020). The characteristics of the early Cambrian sediments suggest that their deposition was controlled by the tilting of (half)grabens and horsts unevenly exposing the basement and sectioning the basin at this stage (e.g Ugidos et al. 2020). The zircon age populations show a general higher proportion of older ages and, locally, Terreneuvian maximum depositional zircon ages (e.g. Orejana et al. 2015), in respect to the Ediacaran.

In this work we present a new interpretation of the Ediacaran-Terreneuvian structure in the Beiras Group (BG) of the SGC in Portugal, based on the stratigraphic harmonization carried out under the scope of the MOSTMEG project, aiming at a synthetic 1:100.000 scale map of the Panasqueira-Segura area in Portugal (Fig. 1). The stratigraphic division reported in Ferreira da Silva (2013) was updated with several field surveys and whole-rock multi-elemental and multi-system isotopic data (Martins et al., in prep.). The map in Fig. 1 was made using data from

published geological maps of Portugal (1:50.000 and 1:200.000, LNEG) along with info gathered in the past two years, namely cartographic, structural, geochemical, and geochronological data. These were set in a GIS environment for management and access and are the base of harmonization presented here.

The stratigraphic harmonization supports the lateral equivalence of the different BG stratigraphic units in the study area. It assumes lateral and vertical stratigraphic variations, as previously reported (e.g. Ferreira da Silva 2013). We have regionally separate two main successions in the BG (Fig. 1). The lower (Ediacaran) corresponds to the Malpica do Tejo Fm. and to the Lower and Distal members of the Rosmaninhal Fm. At the base of the latter members a cartographic unconformity (Alcudian?) could be inferred, considering the geometric relationships established between them and the Malpica do Tejo Fm. However, deformation and geochemical characteristics are identical above and below this unconformity. The upper succession (Terreneuvian-Series 2?) corresponds to a basal olistostrome-rhythmic sequence defining the base of the Upper Mb. of the Rosmaninhal Fm. The basal matrix-supported conglomerate observed to the south of Penha Garcia, can be correlated to the Fuentes/Membrillar olistostromes in Spain, as they mark a clear deformation decrease and a geochemical change of the units above and below these layers. Thus, the regional stratigraphic harmonization of BG in the Panasqueira-Segura area allows to evidence the presence of a pre-Ordovician structure (Fig. 1), as proposed in nearby sectors of the SGC of Spain and Portugal.

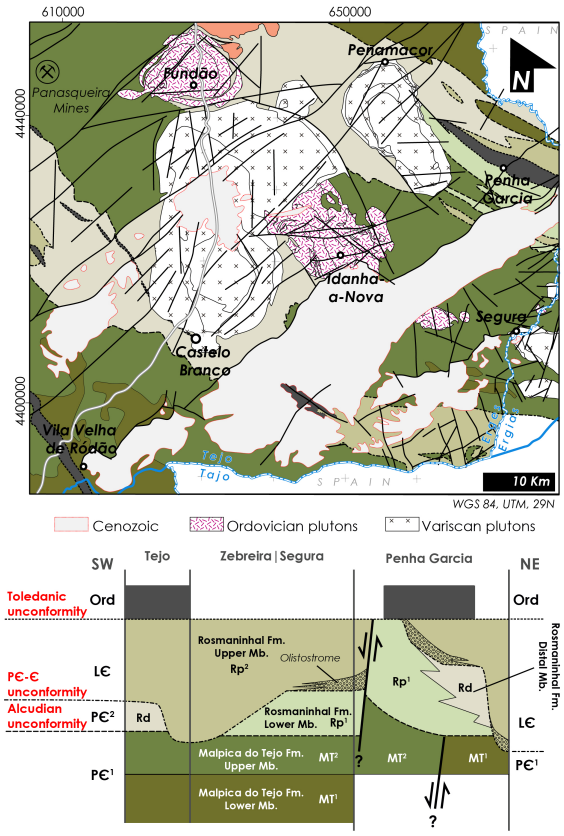

Fig. 1. MOSTMEG project simplified geological map and stratigraphic columns for the BG across the Panasqueira-Segura area. Adapted from (Ferreira da Silva, 2013 and Meireles, 2020) using new data.

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