



## Chronostratigraphic framework and provenance of the Ossa-Morena Zone Carboniferous basins (southwest Iberia)

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**Abstract.** Carboniferous siliciclastic and silicic magmatic rocks from the Santa Susana–São Cristovão and Cabrela regions contain valuable information regarding the timing of synorogenic processes in SW Iberia. In this region of the Ossa-Morena Zone (OMZ), late Carboniferous terrigenous strata (i.e., the Santa Susana Formation) unconformably overlie early Carboniferous marine siliciclastic deposits alternating with volcanic rocks (i.e., the Toca da Moura volcano-sedimentary complex). Lying below this intra-Carboniferous unconformity, the Toca da Moura volcano-sedimentary complex is intruded and overlain by the Baleizão porphyry. Original sensitive high-resolution ion microprobe (SHRIMP) and laser ablation inductively coupled plasma mass spectrometry (LA-ICP-MS) U–Pb zircon are presented in this paper, providing chronostratigraphic and provenance constraints since available geochronological information is scarce and only biostratigraphic ages are currently available for the Santa Susana–São Cristovão region. Our findings and the currently available detrital zircon ages from Paleozoic terranes of SW Iberia (Pulo do Lobo Zone – PLZ – South Portuguese Zone – SPZ – and OMZ) were jointly analyzed using the K–S test and multidimensional scaling (MDS) diagrams to investigate provenance. The marine deposition is constrained to the age range of ca. 335–331 Ma (Visean) by new U–Pb data for silicic tuffs from the

Toca da Moura and Cabrela volcano-sedimentary complexes. The Baleizão porphyry, intrusive in the Toca da Moura volcano-sedimentary complex, yielded a crystallization age of ca. 318 Ma (Bashkirian), providing the minimum age for the overlying intra-Carboniferous unconformity. A comparison of detrital zircon populations from siliciclastic rocks of the Cabrela and Toca da Moura volcano-sedimentary complexes of the OMZ suggests that they are derived from distinct sources more closely associated with the SPZ and PLZ than the OMZ. Above the intra-Carboniferous unconformity, the Santa Susana Formation is the result of the recycling of distinct sources located either on the Laurussian side (SPZ and PLZ) or Gondwanan side (OMZ) of the Rheic suture zone. The best estimate of the crystallization age of a granite cobble which was found in a conglomerate from the Santa Susana Formation yielded ca. 303 Ma (Kasimovian–Gzhelian), representing the maximum depositional age for the terrestrial strata. The intra-Carboniferous unconformity seems to represent a stratigraphic gap of approximately 12–14 Myr, providing evidence of the rapid post-accretion and collision uplift of the Variscan orogenic belt in SW Iberia (i.e., the OMZ, PLZ, and SPZ).