

// MICROSTRUCTURAL AND PETROPHYSICAL PROPERTIES OF CARIA-VILA DA PONTE AND ESMOLFE-MATANÇA LATE- TO POST-VARISCAN GRANITES: IMPLICATIONS FOR ASCENT AND EMPLACEMENT MECHANISMS



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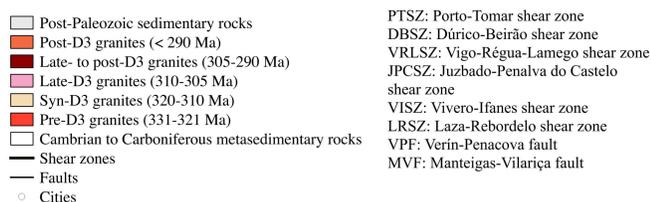
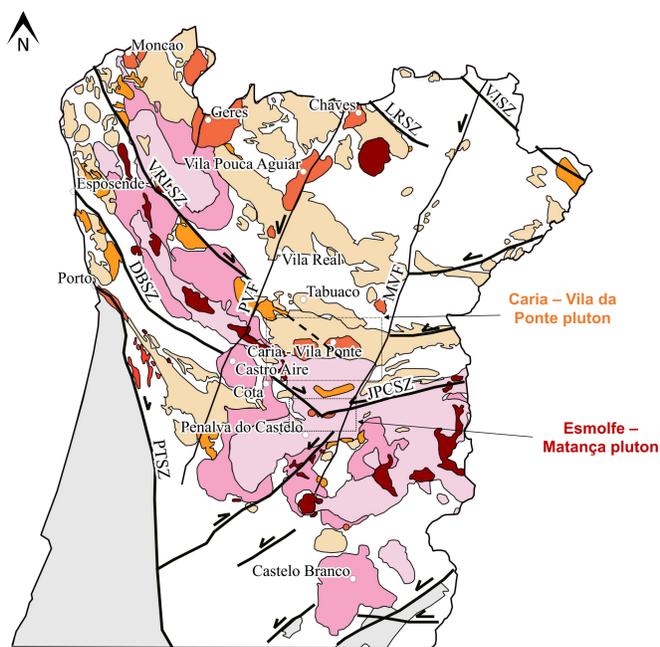
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INTRODUCTION

- **Caria-Vila da Ponte** (CVP, Sernancelhe, 140 km²) and **Esmolfe-Matança** (EM, Penalva do Castelo, 30 km²) are located in the **Northern of Portugal**, within the so-called **Central Iberian Zone (CIZ)**.
- CVP (301.2 ± 1.2 Ma) and EM (298 ± 11 Ma) are similar and characterized by **biotite-rich, medium- to coarse-grained, porphyritic granites**.



GEOLOGY

- Contacts are **sharp, intrusive and discordant** with the general trending of the D₁ and D₃ Variscan structures.
- Each massif is composed of **two circumscribed separated outcrops**:
 - **Caria – Vila da Ponte**: **Caria** outcrop (on the W, ~ 70 km²) - **circular + Vila da Ponte** (on the E, ~ 68 km²) - **E-W elongated body**.
 - **Esmolfe – Matança** (with smaller dimensions): **circular body - Esmolfe** (on the W, ~ 12 km²), and an **E-W elongated suit - Matança** (on the E, ~19 km²).
- Both belong to the **ilmenite-type granites** exhibiting **paramagnetic behaviour**.
- The granites are **not deformed** (paramagnetic anisotropy < 3 %) displaying **dominant magmatic to submagmatic microstructures**, with rare high-, medium-, and low-T solid-state microstructures, preferentially in the granite boundaries.

FIELD OBSERVATIONS



MAGNETIC FABRIC

- **Caria – Vila da Ponte** (for detailed information see [Gonçalves et al., 2019](#))
 - **Subhorizontal magnetic foliations (dominantly NNW-SSE oriented) dipping outwards and parallelized to the contacts**
 - **dome-like structure with asymmetrical laccolithic shape;**
 - **passive ascent and emplacement along reactivated NNW-SSE to NW-SE deep structures** (probably, the Vigo-Régua-Lamego shear zone).
- **Esmolfe – Matança** (for detailed information see [Gonçalves et al., 2020](#))
 - Magnetic fabric suggest an **ascent and emplacement of magmas conditioned by two deep structures**, the **ENE-WSW Juzbado-Penalva do Castelo (JPCSZ)** and the **NW-SE Dúrico-Beirão (DBSZ) shear zones**.
 - The magma **intruded upwards in a passive way along the confluence zone and spread laterally forming an intrusive asymmetric laccolithic body**.

// FINAL REMARKS //

- The magnetic fabric arrangement of both massifs indicates that the ascending and emplacement of magmas were **tectonically controlled and used pre-existing deep structures as conduits**.
- **Predominantly magmatic microstructures + absence of significant deformation patterns at several scales + magnetic fabric arrangement + field relationship + emplacement under low tectonic stress = typical of the late- to post-Variscan granites.**

References
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