

MAFIC VOLCANICLASTIC DEPOSITS OF THE PARANÁ IGNEOUS PROVINCE AND THEIR CORRELATION TO CHEMOSTRATIGRAPHY - STATE OF PARANÁ, BRAZIL

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Chemostratigraphy of the Paraná Igneous Province divides lavas into eight geochemical types, characterized by **High** or **Low** SiO₂, Zr, TiO₂ and P₂O₅ concentrations. Compositional groups highlight two sub-provinces: **South** (SSP) and **Center-Northern** (CNSP). This study examines basic lavas from the State of Paraná: basal **Type 1 S** from SSP (LZr-LTi-LP), and from CNSP middle **Types 2 (HZr-LTi-HP)**, **3 (HZr-HTi-LP)** and **4 (HZr-HTi-HP)**, and upper **Type 1 CN (LZr-LTi-LP)**. Tilting of paleozoic sediments consecutive of the Ponta Grossa Arch (PGA) - as well as compaction related subsidence - produced two major tectonic blocks (Southern and Northern), affecting the current arrangement of the CNSP lava flows. Due to a relative vertical displacement of ca. 500 m, the **Southern Block** exposes younger flows than the **Northern Block**, highlighting differences in distribution of lava types, as well as variability in interflow deposits. Volcaniclastic units intercalated with lavas, interpreted as Mafic Volcaniclastic Deposits (MVDs), were found in 680 sites during geological mapping of the State of Paraná. They contain poorly sorted basal polymictic breccias, grading to tuff-breccias and upper red silicified tuffs. A single clastic package may contain multiple repeated depositional units. Important MVDs in Paraná outcrop in Cruz Machado, Coronel Vivida, Saudade do Iguaçu, Santa Teresa do Oeste and Manfrinópolis in the Southern Block; Cornélio Procópio and Sertanópolis in the Northern block. Deposits of the Southern Block are up to 7 m thick and show chaotic to fluidal breccias (Cruz Machado) with a framework of lithic (hypocrystalline to hypohialine basalt) or glassy blocks and lapilli, along a juvenile hypohialine ash and sideromelane shard dominated matrix with plane parallel lamination (Cruz Machado) or cross-lamination (Santa Teresa do Oeste). Individual units have lateral continuity of hundreds of km, e.g. from Coronel Vivida to Saudade do Iguaçu. A distinctive tuff bed (up to 2 m) composed of basaltic glass pisolites (250-500 µm) with minor reddish brown basaltic spatter lapilli is a useful marker unit. The same pisolitic tuff is also found at Iraí, RS, ca. 220 km to the south. Northern Block clastic units, up to 10 m thick, are mainly composed of poorly sorted polymictic breccias. Siliciclastic matrix is composed dominantly by highly fragmented quartz crystals, while pyroclasts of angular to sub-rounded vesicular and less frequently massive basalt (5 mm to 1 m diameter) form their strongly contrasting (lithologic and granulometrically) framework. MVDs are mainly associated with thick lava sequences of incompatible element enriched basalts showing an alkaline affinity of **Types 2 to 4**, as well as the transition to tholeiitic and compatible element enriched **Type 1 CN** basalts. Deposits are consistent with explosive hydrovolcanic eruptions produced during interaction between ascending magma and deep aquifer systems. Stratigraphic distribution and abundant hypohialine (Type 4) ash and lapilli suggest hydromagmatic eruptions were frequent and widespread during initial to main phases of magmatic evolution in the PIP.

KEYWORDS: SERRA GERAL GROUP; MAFIC VOLCANICLASTIC BRECCIAS; HYDROVOLCANISM.