Mantle Sources of the Paraná Magmatic Province

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The Paraná Magmatic Province (PMP) is represented by flood tholeiites (133-132 Ma) and associated dyke swarms of Ponta Grossa (131-129 Ma), Florianópolis (129-119 Ma) and Santos-Rio de Janeiro (132-119 Ma). The PMP basalts are divided into high- (HTi) and low-Ti (LTi) tholeiites. HTi dominate in the northern PMP, whereas LTi are predominant in the southern PMP. Minor HTi and LTi are found in southern and northern PMP, respectively. Most dykes are HTi-type.

The geochemical and isotopic signatures of the northern and southern PMP tholeiites do not show evidence of a significant participation of N-MORB and/or modern Tristan da Cunha mantle components in their genesis, suggesting that such tholeiites generated from heterogeneous (lithospheric) mantle. The HTi and LTi basalts from northern Paraná, as well as Early and Late Cretaceous alkaline and carbonatitic magmatism that surrounds the central-northern PMP, were significantly dominated by the EMI mantle component. In contrast, depleted DMM-type and EMII components are required to explain the genesis of the LTi tholeiites from southern PMP.