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Origin and age of coeval gabbros and leucogranites in the northern subprovince of the borborema province, NE Brazil

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1        **ORIGIN AND AGE OF COEVAL GABBROS AND LEUCOGRANITES IN THE**  
2        **NORTHERN SUBPROVINCE OF THE BORBOREMA PROVINCE, NE BRAZIL**

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7  
8        **Abstract**

9        The Paleoproterozoic Serrinha – Pedro Velho Complex comprises orthogneisses and  
10        migmatites, exposed in the south part of the Archean São José do Campestre Massif, Rio  
11        Grande do Norte domain of the Borborema Province, NE, Brazil. During the Ediacaran, the  
12        Serrinha - Pedro Velho Complex underwent metamorphism at HT/LP conditions in a tectonic  
13        setting dominated by dextral transpressive deformation, dated at ~575Ma. Crustal melting  
14        generated various plutons and dykes of leucogranites with composition ranging from syeno-  
15        to monzogranites. Mafic rocks, including gabbros, norites and diorites also occur as dykes and  
16        small plutons intruded into the Serrinha - Pedro Velho Complex. Features of mixing and  
17        mingling between mafic and leucogranitic magmas were recorded locally. The granites and  
18        mafic rocks show field features and geochemical signatures of extension related magmatism.  
19        U-Pb SHRIMP zircon data yielded similar Concordia ages for felsic ( $582 \pm 5$  Ma) and mafic  
20        ( $588 \pm 6$  Ma) rocks. The leucogranites have strongly negative  $\epsilon_{Nd}$  (580 Ma) values (-19.8 to -  
21        24.3) and Paleoproterozoic to Archean Nd  $T_{DM}$  model ages (2.2 – 2.6 Ga), similar to those  
22        recorded in the orthogneisses of the Serrinha - Pedro Velho Complex. The mafic rocks show  
23        slightly higher  $\epsilon_{Nd}$  (580 Ma) values (-13.09 to -19.63). The leucogranites were probably  
24        generated by partial melting of a source similar to the Serrinha Pedro Velho orthogneisses.  
25        The mafic rocks are MgO- rich, and the less evolved ones show picritic basaltic composition,  
26        similar to mafic rocks from continental flood basalt provinces. We suggest that melting of

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