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Evidence of volcanism in the Paleozoic metamorphic basement of the Sierra Madre Oriental, NE-Mexico

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The Paleozoic metamorphic basement of the Sierra Madre Oriental comprises a wide variety of protoliths including psammites, pelites, tuffs, lava flows, pillow lavas as well as ultramafic rocks, metamorphosed under subgreenschist to greenschist facies. All these units are grouped under the Granjeno Schist Formation (GSF). They are limited by faults in the core of the Huizachal-Peregrina Anticlinorium (HPA), and in the uplifts of Miquihuana (M), Bustamante (B) and Aramberri (A) in NE Mexico.

The aim of this work is to compare the metavolcanic units in the different localities, looking for a genetic relationship between them. These units include four different lithologies: a) pale green fine grained interstratified horizons of basic to intermediate metatuffs, b) massive, green and coarse greenstones, representing massive metalavas, c) well preserved dark green pillow lavas, and d) pale to dark massive talc schists. They are mainly massive, interbedded with the metasediments and do not display the typical pervasive schistosity of GSF. Preliminary analysis of the metavolcanic units indicate that they are alkaline (AB/OIB). Their origin is still under debate, they could be originated during continental intraplate volcanism or from an ancient oceanic island (?). It has to be noted that the Silurian to Permian HPA′s sedimentary sequence, encloses only a rhyolitic body (Aserradero Fm.) that cannot be directly correlated with the metavolcanics.

The metamorphism age ($\approx$ 330$\pm$30 Ma) and protoliths of all localities are similar, but there are enough petrographic differences to interpret that the metamorphic conditions are not similar at all. It is proposed that the vulcanosedimentary sequence were deposited in a forearc basin along the Pangea western margin, and later metamorphosed during the subduction process through Carboniferous times.