

“Sedimentology and Stratigraphy of Piedras de Afilar Formation, Piedra Alta Terrane, Uruguay”

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The objective of this Project is to study the palaeoenvironmental and provenance aspect of Piedras de Afilar Formation (**PaF**). One specific objective is to find an accurate age for **PaF**.

In respect to palaeoenvironment, the sequence has been defined as *Shallow Marine Platform*. The sequence was described as follows: (a) in the base we find medium grain sandstones with *Interference pattern in symmetrical wave*, typical from beach environment; (b) in the middle, we find sandstones with *hummocky and megahummocky cross bedding*, which are evidence of storm events; (c) at the top of the sequence, we find shales with *parallel stratification*, sometimes interbedded with limestones.

During this research program it was done the first detailed map (1/20.000) for this area. At the same time many stratigraphic columns were released.

As part of provenance studies, palaeocurrents is one important factor. In Cuchilla Alta outcrops, we found excellent trough cross bedding stratification. There the principal palaeocurrent direction is from NE, and there is a subsidiary direction from the SW. The principal direction is concordant with the measured palaeocurrents in sole marks.

Detailed petrographic studies were made counting minerals and classifying sandstones as siltstones with more than 90% quartz, and provenance from stable craton (according to Dickinson et al.).

X ray diffractometry analysis in shales and sandstones showed low metamorphic grade for all the sequence. Arcillites found 80% to 90% Illite, 5% to 10% Kaolinite and 5 to 10% Chlorite in sandstones from the upper siliclastic member, and Chlorite/Smectite was surprisingly found in shales from the top.

All the studies mentioned above are part of field trips and laboratory work done in the “*Centro de Investigaciones Geológicas*”.

It is important to explain that laboratory geochemical analysis (U/Pb SHRIMP and Sm/Nd), which are very important for provenance analysis, were made in Porto Alegre University with Dr. Chemale as it was planned.

However, I didn't go personally, so the money that would be used in flight tickets and expenses in Brazil, was used to support extra field trips in Uruguay, and the cost of necessary materials.

Fortunately the samples could be sent to Porto Alegre University with Dr. Cingolani workgroup.

U/Pb SHRIMP in detritic zircons of La Tuna granite yielded ages of 600Ma (Neoproterozoic). According to this fact, this cannot be used for provenance studies, just because **PaF** presents

ages older than 600Ma. (660Ma according to C and O in limestones, sensus Pamoukaghlian et al.2006).

On the other hand, if we can prove that this granite is intruding the sedimentary sequence, as we have observed in the last fieldtrips, this data could be too important to reveal maximum ages of **PaF**.

Finally, Sm/Nd studies from the middle member of Piedras de Afilar Formation are in process at Porto Alegre University, with Dr. Chemale.

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