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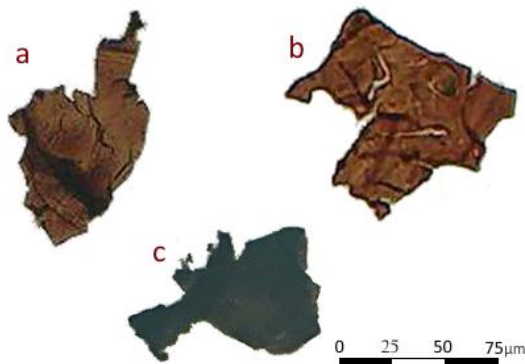
The study of thermal effect on turbidites of Taciba Formation (Permian), Southern of Paraná Basin, Brazil, using X-ray microtomography and palynofacies

Vieira, L.D.¹, Mouro, L.D.^{1,2}, Silva, M.S.¹ and Waichel, B.L.¹

¹Programa de Formação de Recursos Humanos, PFRH-PB 240, Universidade Federal de Santa Catarina, 88040-900, Brazil, lucasdebatin@gmail.com

²Programa de Pós-Graduação em Geologia, Universidade Federal do Rio de Janeiro, 21.941-916, Brazil

The pyrometamorphism is the result of high temperatures and very low pressures caused by the intrusion of hypabyssal bodies, combustion and lightning into sedimentary rocks, with or without interchange of material [1]. It is well-known that the Paraná Basin (Ordovician-Cretaceous), offers examples of this type of metamorphism, and despite many scientist studied bodies and their effect on sedimentary rocks, few works have been focused on the effects in the fossil record. Here we report the effects of basic igneous body (sill) from the Serra Geral Formation (Cretaceous) on sedimentary rocks from Taciba Formation (Permian) at José Guelbcke outcrop, Itaiópolis, Santa Catarina, mainly based on palynofacies and macrofossils. This outcrop comprises a five meters of sill overlain by five meters of fossiliferous turbidite, (Te – division of Bouma sequence, laminated to homogenous mudstones, subdivided in 9 levels). To measure the effects of the pyrometamorphism, we have selected qualitative characteristics on palynofacies analysis, as colour variation of non-opaque phytoclasts and it difficult to be discern from others kerogens components. It was observed a decrease of the thermal effect into the base of the turbidite. These samples are essentially formed by three kerogen groups (40% amorphous organic matter, 59% phytoclast and 1% palynomorphs). At the base (0.5m) no effect has been observed, while at the lower levels (1-2.5m) only a subtle colour variation occur. Through the upper levels (3-4.5m) a progressive effect has been noticed in both criteria, with values of burned non-opaque phytoclasts varying from 23.78% (3m-level 6) to 100% (4.5m-level 9). Furthermore, X-ray microtomography observations on three turbidite samples (levels 1, 3 and 9) showed variation of thermal effect on the porosity, decreasing from 0.27% at the base to zero on the top, which may be associated with the late sill intrusion. Comparing the data from palynofacies, X-ray microtomography and considering that the all macrofossil content is almost formed by imprints of calcarean sponge spicules, which have their calcium carbonate burned by the late heat, we infer that fossil and primary porosity preservation of Taciba Formation has been negatively affected by the sill, with thermal effectiveness of 3 meters beneath the intrusion. Thus, no mineral reconstitution was observed indicating a laminar magma flow, with low contact temperatures [1].



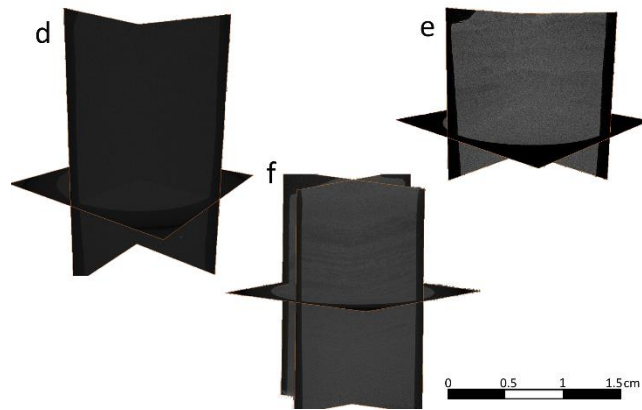


Figure 1: Non-opaque phytoclast from levels 1(a), 3(b) and 9(c), with their X-ray microtomography reconstruction of turbidite samples (d, e and f, respectively), showing slightly variation between them.

References:

[1] Grapes R (2011) *Pyrometamorphism* (2): 364p.

