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Paleoecological and taphonomic analysis of Permian coal seam of Rio Bonito Formation, Paraná basin, western Gondwana*.

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Permian coal seams of Parana basin, although little thick, present interesting paleoecological variations that have been recorded in the associated sedimentary succession. A paleopalynologic and petrographic analysis of the basal portion of the Rio Bonito Formation was held with coal, siltstones, and carbonate samples from the mining fronts of Mine 08 - Coal Company of Cambuí, located in the southeastern portion of Brazil. The objective of the study was to characterize the environmental context deposition of samples, rebuilding the local paleoflora, climate, and environment prevailing at the time of each lithotype deposition. Yet, it was recognized a tonstein layer occurring between siltstones. For the study, it was prepared fossil cuticles and palynologic slides, as well as carbonates and tonsteins thin sections. The thin sections and cuticles were described in petrographic microscope and SEM/EDS. The organic slides were read under an optical microscope of transmitted light. To define the tonstein, we described the typical primary mineral assemblage, which reflects its volcanic origin, and the secondary mineral assemblage, which is authigenic and shows the changes undergone by primary minerals. It was noted, however, that instead of an essentially kaolinitic matrix these tonsteins have a carbonate matrix, which records the diagenetic processes suffered by the rock. It was found that the fossil cuticles belong to Gondwana conifers of genus *Buriadia*. The result matches with data obtained with the study of palynomorphs in coal and siltstones layers. The pollen analysis yielded an age in Asselian-Sakmarian interval, and it also showed the presence of two plant assemblages: one basal for coal layers, reflecting a community close to the depositional environment (dominates spores, fungus and algae), and an other for the top related to siltstones with fossil cuticles and gymnosperms pollens, which refers to a more distal environment from the deposition site. The carbonates presented features that may refer to microbial mats, which were associated with a fauna dominated by mollusks (bivalves and gastropods), and ostracods. In this context, we concluded that originally the environment was reductor and acid, and it was responsible for coal beds generation. Later, it evolutes into a more alkaline and stressful environment, resulting in the disappearance of the first coal plant assemblage, after the fall of volcanic ashes. Eventually, the environment was recolonized by microbial mats with carbonate deposition. Finally, a new floristic community mainly represented by gymnosperms associated with conifers colonized it. *FAPESP 2013/11563-6

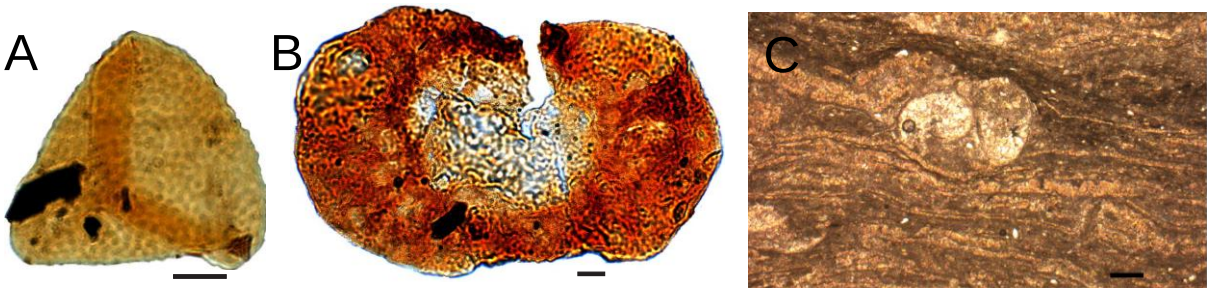

Figure 1: Fossils found. A. Granulatisporites angularis; B. Cahenisaccites ovatus; C. Microbial mats with gastropods. Scales bar A and B= 10 μm, C = 200μm