



Multiple evidence of paleowildfires within mire systems from the Late Paleozoic of the Paraná Basin, Brazil

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Macroscopic charcoal is widely accepted by the scientific community as a direct indicator of the occurrence of paleowildfires. For the Late Paleozoic of the Northern Hemisphere records of macroscopic charcoal are relatively common and more or less homogeneously distributed. However, the Southern Hemisphere can largely be considered an “undiscovered” area for this type of fossils and only few records have so far been reported. For the Brazilian Paraná Basin, the first paleobotanical evidence as represented by macroscopic charcoal has so far been described in detail just from a single site [Quitéria Outcrop (Kungurian of the Rio Grande do Sul State)]. During recent fieldwork a number of new occurrences have been discovered and at the moment macroscopic charcoal remains can be considered a common element at the Southern and Southeastern borders of the Paraná Basin, throughout the Rio Bonito Formation coal forming interval. Up to now samples from the Recreio, Seival, Faxinal and Morro Papaléo mines (Sakmarian, Rio Grande do Sul State), Bonito I mine (Artinskian, Santa Catarina State) and the Figueira coalfield (Artinskian?, Paraná State) yielded macroscopic charcoal. All the charcoal fragments are relatively large (between 1.1 x 0.6 x 0.2 and 10.2 x 3.7 x 0.9 cm) with non-abraded edges indicating that transport has been short or absent prior to sedimentation. However, in most cases the woody tissues have been shattered into more or less small pieces by compression during diagenesis. The anatomical characteristics were sufficiently preserved to establish a connection of the charred woods to gymnosperms and arborescent lycopsids. The occurrence of macroscopic charcoal remains in different mire systems of the Paraná Basin’s Late Paleozoic, adds evidence to previous studies which demonstrated the abundant presence of inertinite as a petrographic component of coal in different coalfields, suggests that palaeowildfires have been common during the Early Permian in the Western Gondwana Realm and affected the vegetation responsible for the formation of the original coal biomass.