

# THE BURNING GONDWANA: CHARCOAL AS EVIDENCE OF LATE PALEOZOIC PALEOWILDFIRES.

*André Jasper<sup>1</sup>; Margot Guerra-Sommer<sup>2</sup>; Dieter Uhl<sup>3</sup>.*

<sup>1</sup> Centro Universitário UNIVATES; <sup>2</sup> Universidade Federal do Rio Grande do Sul; <sup>3</sup> Senckenberg Forschungsinstitut und Naturmuseum.

**ABSTRACT:** Macroscopic fossil charcoal has widely been accepted as a direct evidence of the occurrence of paleowildfires and, in Upper Paleozoic sediments of Euramerica and Cathaysia, records of these remains are relatively common and more or less homogeneously distributed. On the other hand, just a few records had been made for the Gondwana (Jasper et al., 2011) and, only recently it has been demonstrated that macroscopic charcoals were also common in the Late Paleozoic of the continent. The most important Gondwanic records are related especially to coal bearing strata and are spread out in different sequences and also in distinct stratigraphic intervals in the Permian at the Cool Temperate Biome [e.g. Paraná Basin (Sakmarian/Artinskian of Brazil), Karoo Basin (Guadalupian of South Africa), Damodar Valley Basin (Lopingian of India)]. The presence of charcoal fragments in non-peat levels of the topmost Permian on Northern Gondwana Wadi Himara Basin (Changhsingian of Jordan – Uhl et al., 2007) when warm climate conditions took place, is direct evidence that fire still was an important disturbance factor at the end of the Permian. The abundance of evidence for Permian wildfires in Southern Permian Temperate Biomes seems to prove that wildfires occurred at different spatial and temporal scales during the course of the Permian in Gondwana, during the transition from a cold to cool and warm climate interval. The estimated high atmospheric oxygen concentration which peaked during the Early Permian made vegetation highly flammable even under wet conditions (Belcher et al., 2010). The macroscopic charcoal remains confirmed that paleowildfires occurred in high latitudes and promptly after the deglaciation. The scarcity of charcoal remains after the cessation of peat deposition in the warm topmost Permian, besides estimations of elevated O<sub>2</sub> levels until at least the latest Permian could be attributed to climatic change that may bring about directional changes in the frequencies and magnitude of these fire events (DiMichele et al., 2004). Furthermore the high incidence of charcoal indicates that the paleoenvironmental conditions in Western and Eastern Gondwana during the Late Paleozoic were adequate for fire occurrence.

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**KEYWORDS:** PERMIAN; PALEOCLIMATE; PEAT DEPOSITION.