

***Araucaria megastrobili* from Crato Formation Flora, Brazil**

Paula Andrea Sucerquia Rendon^{1,2}, Paulo Eduardo de Oliveira¹,
Gabriel Ladeira Osés¹, Gustavo Prado¹, Douglas Galante³

¹ Universidade de São Paulo, São Paulo, Brazil, psucerquia@gmail.com

² Universidade Federal de Pernambuco (UFPE), Recife, Brazil

³ Laboratório Nacional de Luz Síncrotron (LNLS), Campinas, Brazil

Crato Formation has been recognized as a prolific source of information about Early Cretaceous paleobotany, with species of diverse groups as pteridophytes, conifers, gnetales and angiosperms. Conifers are abundant and their representatives belong to the families Araucariaceae and Cheirolepidiaceae, although several fossil plants sharing features with conifers are still with uncertain affinity. One of the most abundant of these fossil fragments, correspond to putative megastrobili formerly assigned to *Araucaria* Jussieu, its affinity is based in the araucarioid shape and size of the cone, the helically arrangement of bract-scale complexes with araucarioid shape, and the presence of a single, probably, wingless seed. Here, were analyzed 25 of that megastrobili, with two different modes of preservation, as iron oxides and coalifications. Variations in shape, and size ranges of several features were determined, and its botanical affinity and ontogeny discussed. Also a detailed analysis of an isolated bract-scale belonging to this type of cone, using Synchrotron X-Ray Fluorescence elemental mapping was performed in order to reveal hidden morphological structures in matrix and have some clues to understand taphonomic processes. [*Acknowledgements to Fundação CAPES, Process 1536356 and Laboratório Nacional de Luz Síncrotron (LNLS), Proposal 20150110, XRF Beamline*]

Keywords: Crato Formation Flora, late Aptian, *Araucaria*, megastrobili, X-Ray Fluorescence

Tracking the depositional associations of palynological assemblages within southeastern Australia's Early Cretaceous Gippsland Basin

Prudence V. Perry¹, Shannon Herley¹, Chris Mays¹, Mike Hall¹

¹ Monash University, Melbourne, Australia, prudence.perry@monash.edu

Palynofacies assessment of kerogens sourced from fluvial deposits with distinctive sedimentary stacking patterns is a unique approach to unravelling spatial distributions of palaeofloral communities. This approach may be applied in the subdivision of other undifferentiated (regionally uniform) fluvial units found globally. Understanding of the early stratigraphic and biogeographic development of the Gippsland Basin, southeastern Australia, has been hindered by the lithologically undifferentiated character of the basin's basal unit, the Early Cretaceous Strzelecki Group. This unit represents the early phases of rift development, largely comprising volcanogenic deposits of fluvial sandstone and siltstone facies, lacustrine siltstone and claystone facies, and multiple thin coal beds. These elements are stratigraphically discrete, with minimal lateral extension depicting complex fluvial geomorphological architecture. Strzelecki Group outcrops contain multiple vertebrate and invertebrate animal fossil beds from which bird, fish, reptile, mammal, dinosaur, and insect material have been recovered. In addition to this fossil fauna, the deposits contain assemblages of macro-, meso-, and microfloral fossils. To date, detailed determination of the biogeographic distribution of floral elements within this rich ecosystem has not been possible. This is due to an incomplete understanding of the role of tectonic controls on sedimentation style and the subsequent distribution of local vegetation types within the rift valley. This research is focused on: i) determining the environmental and depositional associations of facies present throughout outcrop of the Strzelecki Group on southeastern Australia's west Gippsland coast; and ii) investigating the relationship of these associations to the spore-pollen and sedimentary organic matter assemblages recovered. This enables placement of these deposits, and their preserved biota, into a derived palynological framework. Assemblages can be correlated with their respective environmental positions (i.e. palaeochannel proximity), and placed into the broad palaeobiogeography of the high-latitude and relatively warm Early Cretaceous eastern Gondwana. Detailed stratigraphic logging and facies description of coastal outcrops has enabled the classification of three major fluvial depositional associations (active channel, abandoned channel, and floodplain). Each being defined by its stratigraphic stacking pattern, sedimentary geometries, and textural features, allowing a novel palynological sampling approach. The parameters investigated during kerogen palynofacies analyses on assemblages recovered from each major facies association are presented, along with results to date. Within this study, preliminary