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# ABSTRACT BOOK

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**New Ordovician palynostratigraphic data of the *Phyllocytes* Shales Formation, Barrancos Region, Ossa Morena Zone, Portugal**

POSTER IN SESSION S38

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The Ossa Morena Zone, well represented in the Barrancos region, with Cambrian to Lower Devonian strata. The Ordovician contains from base to top the Barrancos Formation, greenish to purple shale; the *Phyllocytes* Shales Formation, micaceous green to grey shale and the Colorada Formation, psammitic and quartzitic beds. The roadcut (EN258), 325 m SW of the Gata geodesic point, contains the *Phyllocytes* Shales Formation. Cunha & Vanguetaine (1988) based on material collected from this outcrop, presented the first acritarch assemblage for the *Phyllocytes* Shales Formation with poorly to moderately preserved material assigned to the Arenig-Llanvirn interval. To better constrain this age interval, 10 samples were prepared showing moderately preserved palynomorphs. The assemblage includes: *Acanthodiacrodium* spp., *A. costatum*, *Arkonina* cf. *A. triangulata*, *A. virgata*, *Aureotesta clathrata* var. *simplex*, *Baltisphaeridium* spp., *Caldariola* cf. *C. glabra*, *Coryphidium* spp., *C.* cf. *C. bohemicum*, *C. elegans*, *Dasydorus cirritus*, *Dicrodiacrodium* sp., *Dictyotidium* spp., *Frankea* sp., *Goniosphaeridium* spp., *Leiosphaeridia* spp., *Multiplicisphaeridium* spp., *Polygonium* spp., *P. gracile*, ?*Rhopaliophora* sp. A, *Solisphaeridium* spp., *Stellechinatum celestum*, *St.* spp., *S. ?stelligerum*, *S. striatulum*, *Striatotheca monorugulata*, *S. principalis* var. *parva*, *S. quieta*, *S. rarirrugulata*, *Vavrdovella areniga*, *Veryhachium lairdii*, *V. trispinosum*, indicating an Late Arenig age (Late Dapingian/Early Darriwilian). This assemblage confirms the macrofossil age given by *Expansograptus* graptolites collected from the *Phyllocytes* Shales Formation in the Mestre André Quarry, Portugal. In Spain, acritarch age determinations along the Ardila river (Badajoz Province), in the upper part of

*Phyllocytes* Shales, confirm the Late Dapingian/Early Darriwilian age based on the occurrence of *Arbusculidium filamentosum*, *Aureotesta clathrata*, *Coryphidium bohemicum*, *C. elegans*, *Ericanthea pollicipes*, *Striatotheca monorugulata*, *S. quieta*, *S. rarirrugulata* and *S. rugosa*. However, *Cymatiogalea* cf. *C. messaoudensis*, *Priscogalea* sp., *Villosacapsula pilifera*, *Virgatasporites rudii* suggesting reworking of early Ordovician acritarchs (*messaoudensis-trifidum* Assemblage). This age was also recognized in Spain (OMZ), *in situ* in the Barriga Formation and more recently W of Oliva de la Frontera (Badajoz Province).

**Palynostratigraphic study of Lower Karoo rocks in the Moatize-Minjova Coal Basin, Mozambique – Preliminary Results**

TALK IN SESSION S38

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The Karoo Supergroup (KSG) is one of the most important geological units of southern Africa. The KSG is well represented in the Tete Province along the Zambezi River in several horst and graben basins (Afonso et al., 1998; GTK Consortium, 2006; Vasconcelos & Achimo, 2010). The sedimentary succession in the Moatize-Minjova Coal Basin, located 55 km from Tete city, starts with the Vúzi (tilite) Formation, Upper Carboniferous–Lower Permian by correlation with the Dwyka unit in the main Karoo Basin (South Africa), followed by the Cisuralian Moatize (sandstone) Formation, the Guadalupian–Lower Lopingian Matinde (marlsandstone) Formation and the Middle Lopingian–Lower Triassic Cádzi (sandstone) Formation. Two boreholes (ETA 65 and ETA 72) in the Moatize-Minjova Basin are studied for palynostratigraphy. 9 of 20 samples from the upper levels of the Vúzi Formation and the lower levels of the Moatize Formation contain moderately preserved palynomorphs of a Kungurian/Roadian (early/mid Permian) age. The two formations contain qualitatively and quantitatively different palynomorph assemblages. The assemblage recovered from the

Vúzi Formation (ETA 65 and ETA 72) shows a lower percentage of trilete and monolete spores, a lower to common percentage of monosaccate and colpate pollen grains and is dominated by disaccate (taeniate and non-taeniate) pollens. The Moatize Formation yields a palynomorph assemblage with common to abundant trilete spores and disaccate (taeniate and non-taeniate) pollen grains and a lower percentage of monosaccate and colpate pollens. The assemblages include the diagnostic species: *Alisporites potonie*, *A. ovatus*, *Cirratriradites africanensis*, *Protohaploxylinus* spp, *Vittatina costabilis*, *Striatopodocarpites cancellatus*, *S. fusus*, *Weyllandites lucifer*, *Platysaccus papilionis* and *Lueckisporites virkkae*. The difference in palynological assemblage between the two formations may be due to palaeoenvironmental variation related to climate, with colder temperatures associated with the post-glacial tillite facies of the Vúzi Formation and with warmer temperatures associated with the grey and black carbonaceous shale of the Moatize Formation. Ongoing studies are developed to classify and characterize the palynological successions of the Moatize-Minjova Coal Basin in order to better understand the palaeoenvironments and palaeoecosystems; to constrain the end of the Late Palaeozoic glaciation and better comprehend the structure of the sedimentary basin including the distribution of the coal seams.

### The petrified forest ecosystem of Chemnitz (Early Permian) – Indications for climatic and site-specific environmental conditions derived from the palaeosol

TALK IN SESSION S6

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The Petrified Forest of Chemnitz is an outstanding example of an early Permian forest ecosystem preserved by an explosive volcanic event. The fossil site represents a 3D-snapshot of a floodplain environment in the Leukersdorf Formation of the Chemnitz Basin, 291 Ma ago. A detailed reconstruction of the ecosystem as well as its surrounding environment will contribute towards the understanding of Permian continental ecosystems in general. Climatic and site-specific indications can be

gained from both palaeobotanical research and from sedimentological investigations of the palaeosol. On the basis of petrological, mineralogical and geochemical analysis of sedimentary rocks from the first scientific excavation site in Chemnitz-Hilbersdorf (2008–2011), a model for the genesis of the palaeosol horizon can be developed. The more than two metres thick section results from the stacking of several palaeosols. The uppermost horizon is densely rooted and interpreted as an inceptisol, which shows a very low degree of chemical alteration during pedogenesis. In the immature substrate the upright-standing *in situ* rooting plants and trees represent a pioneer forest community. The coexistence of both ferric and carbonate concretions in the upper part of the palaeosol is an indicator of distinct seasonal climatic conditions with a change between wet and dry phases, probably similar to a monsoonal climate. On the basis of the major element concentrations, different empirical calculations for the mean annual precipitation produce values between 800 and 1.200 mm/a. In the lower part of the palaeosol profile, nodules and large blocks of carbonate appear, coincident with a general bleaching and mottling of the sediment. Carbonate precipitation took place in the presence of groundwater and suggests a high and largely stable groundwater table. The characteristics of the general rooting patterns and the architecture of the root systems lead to the assumption, that water must have been available throughout the year. Different individuals of calamitaleans, tree ferns, cordaitaleans and medullosan seed ferns have been found at this site and point to a hygrophilous forest community. During dry phases, frequently revealed by growth ring patterns of the woody plants, the vegetation may have been maintained by a stable groundwater table and reduced evapotranspiration in the forested environment. A remaining unresolved question is to what extent this local fossil Lagerstätte represents the regional conditions of the Chemnitz Basin in the upper Leukersdorf Formation. According to sedimentary and biofacies there is clear evidence for increasing dryness in the Leukersdorf Formation, in which the fossil forest ecosystem might represent a restricted oasis-like occurrence. In 2012, a second scientific excavation site was established to investigate site-specific variabilities.

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