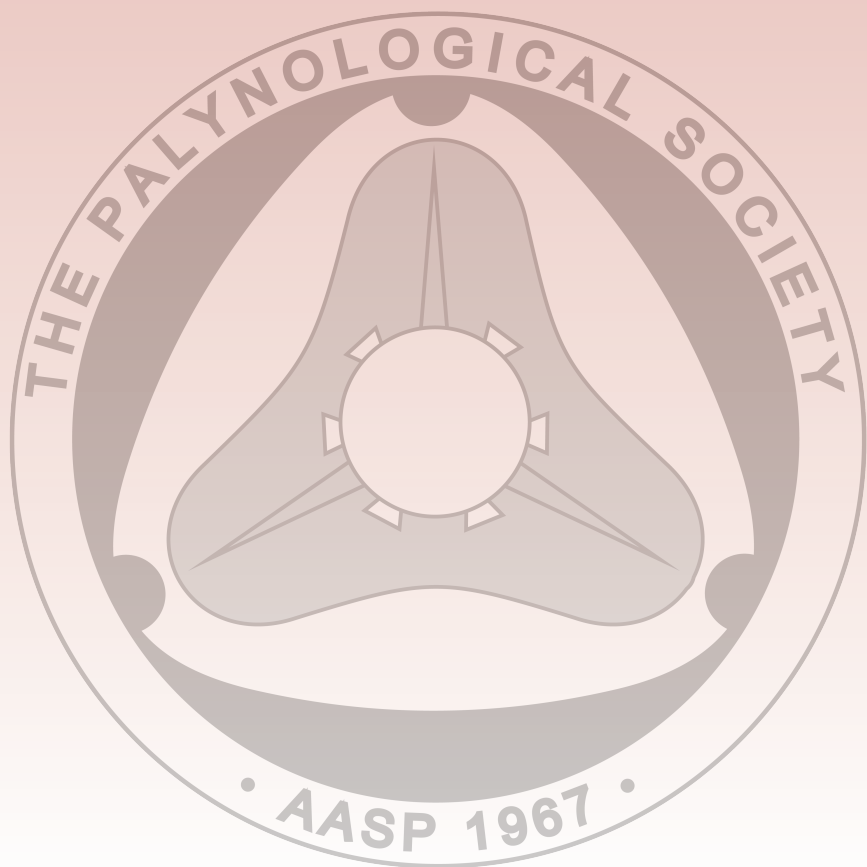


# AASP- THE PALYNOLOGICAL SOCIETY



Jen O'Keefe walking across "Sky Bridge" in the Red River Gorge National Geological Area during the pre-meeting field trip.  
*by Cortland Eble*

## NEWSLETTER



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Morehead State University  
Morehead, KY

**Lexington 2012:**

**A Joint Meeting of  
the 45<sup>th</sup> Annual Meeting of AASP - The Palynological Society and  
Meeting of the CIMP - Commission Internationale de la Microflore du  
Paléozoïque Subcommissions**

**21-25 July 2012**

**Program and Abstracts**



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EARTH & SPACE SCIENCE

# **45<sup>th</sup> Annual Meeting of AASP - The Palynological Society and Meeting of the CIMP - Commission Internationale de la Microflore du Paléozoïque Subcommissions**

At the  
William T. Young Library and Kentucky Geological Survey  
University of Kentucky  
Lexington, KY  
USA

## **Organizing Committee:**

Cortland Eble  
Jen O'Keefe

## **CIMP Symposium Coordinators:**

Zélia Pereira  
Reed Wicander

## **Special Thanks to our Volunteers:**

Charles Mason	Andrea Connor
Elizabeth Roland	Mandy Long
Steve Martin	Mike Lynch
Richard Smath	Don Chesnut
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## **Meeting Spaces and Posterboards Provided by:**

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recurrence interval for turbidites. Oxidative loss of ~24% OC to produce 0.18 Pg CO<sub>2</sub> indicates that slope apron systems are surprisingly inefficient mechanisms for organic carbon burial, in contrast to presumed much more efficient submarine fan systems. Such contrast between deep water turbidite depositional systems may have implications for major burial terms in carbon cycle modelling.

**Keywords:** carbon burial, turbidites, palynofacies, Holocene/Recent, Moroccan Turbidite System

## Palynology of the Kingscourt Outlier (Ireland)

Paulo Fernandes<sup>1</sup> and Geoff Clayton<sup>2</sup>

<sup>1</sup>CIMA - Centro de Investigação Marinha e Ambiental, Universidade do Algarve, Campus de Gambelas, 8003-139 Faro, Portugal (pfernandes@ualg.pt). <sup>2</sup>Department of Geology, Trinity College, University of Dublin, Dublin 2, Ireland (gclayton@tcd.ie)

The Kingscourt Outlier occupies a roughly triangular area on the southern part of the Lower Palaeozoic Longford–Down Massif in eastern Ireland. It comprises a condensed succession of sedimentary rocks that record the onset of fluvio-deltaic sedimentation across eastern Ireland during Late Viséan to Late Bashkirian (Jackson, 1955, 1965). The outlier forms a syncline structure with an axis orientated approximately north-south and parallel with the normal Kingscourt Fault that downthrows beds of Carboniferous and Permo-Triassic age against the Lower Palaeozoic rocks. Variscan deformation and subsequent erosion affected the area, since the base of the oldest Permian rocks rest unconformably on various Carboniferous units. Post-Variscan subaerial exposure was responsible by partial oxidation and reddening to various depths of the upper Bashkirian beds.

Four outcrops of the Kingscourt Carboniferous succession were studied for biostratigraphical palynology. The first outcrop is located along the Ardagh Glen and exposes the Ardagh Shale. From the samples studied only one, Ard 8, located in the middle part of the approximately 70 m thick succession, yielded miospores. The occurrence of the key species *Verrucosisporites morulatus* is indicative of the upper part of the NC biozone (Owens *et al.* 2004) and assigns the Ardagh Shale to the late Pendleian, which is consistent with the age of the goniatite *E. pseudobilingue* recorded by Jackson (1955, 1965).

The second outcrop corresponds to the Carricleck Shale and was investigated in the disused Carricleck Quarry. The samples studied were located in the basal part of the Carricleck Shale; CQ 1 immediately above the sandstones, and CQ 5 about 1.3 m above the sandstones. The samples yielded a relatively abundant miospore assemblage dominated numerically by the genera *Densosporites* and *Lycospora*. Only five different species were found occurring in both samples studied. The miospore taxa recorded from the Carricleck Quarry indicate a possible transitional age between the TK and SO biozones. The occurrence of the species *Kraeuselisporites ornatus* is indicative of the SO biozone as appears at its base (Owens *et al.*, 1977). The miospores *Knoxisporites dissidius* and *Ibrahimisporites brevispinosus* also suggest a SO biozone age. However, *Tripartites vetustus*, disappears at the top of the TK biozone (Owens *et al.*, 1977). The miospore can be interpreted either as suggesting a position for the samples at the TK/SO boundary, or, that the specimens of *T. vetustus* are reworked. The age for the basal part of the Carricleck Shales as suggested by miospore taxa is younger than the age assigned to Jackson (1955, 1965) based on goniatites. Jackson (1955, 1965) recorded *E. bisulcatum* (E2a) and *C. nitidus* (E2b) indicating a lower to middle Arnsbergian age, respectively. Whereas the miospore taxa suggest an age of late Arnsbergian to early Chokierian.

Seven samples from the Clontrain section were studied. The samples yielded a diverse miospore assemblage with 48 different species recorded. Although diverse, this assemblage is dominated by a restricted number of miospore genera; *Densosporites*, *Lycospora* and *Crassispora kosankei*. Samples Clt. 4 and Clt. 6 are from the *Reticuloceras reticulatum* (R1c) Marine Band (Jackson, 1955, 1965). Perhaps the most reliable indication of the age of the Clontrain section is the great number of *Crassispora kosankei*, which was recorded from all the samples from this section. This miospore species occurs from the biozone NC onwards but in low numbers until the base of the KV biozone. Other species that strongly suggests the KV biozone is the presence of *Kraeuselisporites echinatus*. The appearance of the species *Cristatisporites indignabundus* indicates the lowermost part of the FR biozone (Owens *et al.*, 1977) suggesting that the age of Clontrain section lies at the KV/FR boundary. The occurrence of *Tripartites vetustus* and *Tripartites trilinguis* can be interpreted as recycled species since both species are thought to disappear at the top of the TK biozone. The age of the Clontrain section given by the miospore assemblage is consistent with to the upper Kinderscoutian age based on the goniatite faunas (Jackson, 1955, 1965) but could indicate a slightly younger (Marsdenian) age. A single sample studied from the Kilmainham Wood section yielded a miospore assemblage similar to the Clontrain section, although the number of taxa recorded was lower. The Kilmainham Wood section can be therefore assigned to the KV biozone which corresponds to the Kinderscoutian to upper Marsdenian. However, since *Reticuloceras reticulatum* (R1c) was previously recorded from shales in this locality (Jackson, 1955, 1965), an upper Kinderscoutian age is the most likely.

**Keywords:** Namurian, Palynology, Kingscourt Outlier, Ireland

## Provenance of the reworked Ordovician Palynomorphs in SDJ1 Borehole - Santa Susana Basin, Ossa Morena Zone, Portugal

G. Lopes<sup>1,2</sup>, Z. Pereira<sup>2</sup>, P. Fernandes<sup>1</sup>, J. Matos<sup>3</sup>, D. Rosa<sup>4</sup>, J.T. Oliveira<sup>5</sup>

<sup>1</sup>Centro de Investigação Marinha e Ambiental (CIMA), University of Algarve, Campus de Gambelas, 8005-139 Faro, Portugal; <sup>2</sup>Laboratório de Geologia e Minas (LGM), Laboratório Nacional de Energia e Geologia (LNEG), Rua da Amieira, 4465-965 S. Mamede Infesta, Portugal; <sup>3</sup>LGM-LNEG, Rua Frei Amador Arrais, 39 Apartado 104, 7801-902 Beja, Portugal; <sup>4</sup>Afdeling for Petrologi og Malmgeolog, Nationale Geologiske Undersøgelser for Danmark og Grønland (GEUS) Øster Voldgade 10, 1350 København K, Danmar; <sup>5</sup>LGM-LNEG, Estrada da Portela, Zambujal Apartado 7586, 2611-901 Amadora, Portugal.

The detail palynological study of the exploration borehole SDJ1 located in the Santa Susana / Moinho da Ordem disused coal mine area (1927-1944), western border of the Ossa Morena Zone (OMZ) in Portugal, is presented here.

The borehole intersects lithologies of the Toca da Moura Complex (TMC) and the Santa Susana Formation (SSF), dated as mid late Viséan and Moscovian (Carboniferous), respectively, based on palynomorphs (Cunha in Andrade *et al.*, 1991; Pereira *et al.*, 2006; Machado, 2010; Pereira *et al.*, 2011) and macroflora (Wagner & Sousa, 1983).

Together with the miospore associations recovered, assemblages of exceptional well- preserved Lower Palaeozoic acritarchs, cryptospores and spores were identified, which are interpreted as

reworked. From these, the major percentage is Ordovician acritarchs. The ages of the reworked palynomorphs suggest that considerable erosion of exposed

Lower Palaeozoic OMZ basement occurred during early Carboniferous times. The exposure of these rocks may have occurred by the first phases of the Variscan Orogeny in the OMZ.

In this work the acritarch assemblages recovered from the SDJ1 borehole are compared with the acritarch assemblage identified from the *Phyllodocites Shales* Formation (Cunha & Vanguetaine, 1988; Pereira et al, 2011) in Barrancos region. Due to the resemblance in the acritarchs assemblages of both places we suggest that the Early Ordovician *Phyllodocites Shales* and correlatives were one of the main sources of the reworked acritarchs (Piçarra et al., 2011).

**Keywords:** Ordovician; palynomorphs; Santa Susana Basin; Portugal.

## **‘Palynomorph Darkness Index’ – a new method for determining thermal maturity**

Robbie Goodhue, Geoff Clayton, and Abigail Rooney

Department of Geology, School of Natural Sciences, Trinity College, University of Dublin, Dublin 2, Ireland

Palynomorph Darkness Index (PDI) is a new thermal maturity indicator. It is calculated from measurement of the red, green and blue (RGB) intensities of light transmitted through palynomorphs, using standard palynological microscopes and digital cameras. Laboratory heated Tasmanites show a progressive increase in PDI with increasing temperature suggesting that the technique is applicable through a broad temperature range, encompassing the whole of the oil window and at least part of the zone of dry gas generation. Potential applications of this inexpensive method include the estimation of thermal maturity of sections deficient in vitrinite, such as pre-Devonian strata and many marine black shales. PDIs determined by different microscope and camera combinations show excellent correlation, suggesting that the method is largely platform-independent. Calibration is achieved using photographic filters as standards.

**Keywords:** Palynomorph Darkness Index; maturity; Tasmanites; transmitted light; RGB.

## **PDI of Mississippian palynomorphs heated by an igneous intrusive**

Robbie Goodhue, Benjamin Lawlor, and Geoff Clayton

*Department of Geology, Trinity College, University of Dublin, Dublin 2, Ireland.*

The range of palynomorph colours within a sample is dependent on the diversity of taxa in terms of their wall thickness, ornamentation, and folding and, most significantly, the degree of thermal maturation they have experienced. The Palynomorph Darkness Index (PDI) method has been developed to allow accurate, rapid and low-cost quantification of this maturation-related colour change.