Symposium session in IPC/IOPC 2012

Categories of symposia

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2. Innovative tools for palynological and palaeobotanical studies
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Symposia

1. Airborne pollen and spores as allergic agents

(SS02) Cross-reactivity of pollen allergy
Organizers: Terumi Midoro-Horiuti, Yasuto Kondo & Reiko Kishikawa
Contact email address: tmidoro@utmb.edu
Purpose: Plants from related species have cross-reactive allergens. Some of the pollen allergens induce oral allergy syndrome (OAS) among pollen allergen sensitized subjects when ingesting food which contain cross-reactive allergens. We will discuss recent findings on cross-reactivities among pollen allergens including OAS.

(SS15) Impact of Climate Change on Aeroallergen, Asthma and Clinical Immunology
Organizers: Anand Bahadur Singh & Jae-Won Oh
Contact email address: singha49@hotmail.com
Purpose: It is now well established that green house gases such as Co2, ozone and also global temperature is increasing all over the world. Records from long term data on pollen monitoring from several countries particularly Europe and USA reveal that the concentration and duration of airborne pollen in the air are increasing and this could be due to early and prolonged flowering season of allergenic pollen. The greater increase in concentration and duration leads to increased exposure of patients with respiratory problems with acute and severe respiratory problems. The increased incidence of respiratory allergic diseases all over the world including developing countries is also partially suspected to be due to global warming.

(SS27) Recent airborne allergenic pollen and spore research: phenological trends in different locations
Organizers: Norio Sahashi, Jae-Won Oh, Reiko Kishikawa & Teiji Kondo
Contact email address: sahashi@phar.toho-u.ac.jp
Purpose: 1. Clarify correlation with annual change and the seasonal variation of the allergenic pollen and spore, and the climate factors.
2. Compare the latest scattering tendency in the different location, and the characteristic scattering pattern by the area exists or not.
3. Explore the compatibility from comparison of the scattering pattern by the gravitational method and the volumetric one.
4. Verify correlation by hourly scattering pattern by automatic monitoring device and climate factor

(SS28) Recent methodology for pollen dispersal forecast
Organizers: Motoo Suzuki, Kyu Rang KIM & Hidetoyo Teranishi
Contact email address: moto@jmbsc.or.jp
Purpose: Currently, pollen allergy has become a worldwide problem. It is important to improve pollen dispersion forecast accuracy in order to avoid pollen exposure. This symposium purposes summarize the recent and advanced forecasting method of the pollen dispersion in the world and discuss both these advantages and disadvantages for the information accuracy and handling simplicity. And then we hope that these results will be induced to be useful in the treatment of symptoms of the pollinosis and the control in the patients increase.

(SS43) New trends of the diagnosis and therapy of pollinosis (Invitation only, in Japanese)
Organizers: Toru Imai & Reiko Kishikawa
Contact email address: imaitoru@tky.3web.ne.jp
Purpose: Pollinosis is a common disease in almost of all countries. Many patients are suffered from pollinosis having severe rhinoconjunctivitis symptoms and lower quality of life (QOL). This session introduce some guidelines which indicate standard therapy, and new method to treat pollinosis.

2. Innovative tools for palynological and palaeobotanical studies

(SS01) Palynological electronic resources and methods of palynological data processing and summarization
Organizers: Dmitriy Britski & Olga Gavrilova
Contact email address: dmibri@mail.ru
Purpose: The great volumes of extremely valuable information concerning the pollen morphology of different taxa of modern and fossil plants as well as different applied and theoretical aspects of palynology was accumulated in laboratories of palynology around the world. The digitization of available data and bringing them into a form available for a wide range of specialists makes it possible:
1) to avoid recurrent studying of the same material;
2) to prevent material loss due to natural aging of collections;
3) to present results of investigation in full mode, without constriction of ordinary journal publication and
4) make laboratory’s archives accessible for scientific community.
In the near future the separated electron resources will be obviously united in the integrated information system that could bring applied and fundamental palynological studies up to the new standard by accumulation of information.
Methods, technologies, and approaches to development of informational systems and their integration are suggested to be discussed.

(SS07) Quantitative reconstructions of past vegetation/land cover at local to continental spatial scales using pollen records– potentials and limits
Organizers: Marie-José Gaillard, Shinya Sugita & Jack Williams
Contact email address: marie-jose.gaillard-lendahl@lnu.se
Purpose: 1. Gather together all scientists developing methods to describe past land-cover changes at the regional-continental and local spatial scales
2. Gather together scientists who attempt quantitative reconstruction of past vegetation/land-cover in order to answer specific research questions
3. Review the progress in quantitative reconstructions of past vegetation in different parts of the world
4. Discuss collaborative strategies to achieve high quality, quantitative descriptions of past land-cover over the globe for the purpose of climate modeling and a better understanding of past environmental changes and their causes
5. Discuss the potential of quantitative reconstructions of vegetation at the local spatial scale for research questions at the palaeoecology-ecology/conservation/landscape management interface.
(SS09) Quantifying Cenozoic vegetation – new developments in standardized approaches (a joint ROCHEH and NECLIME symposium)

**Organizers:** Angela A. Bruch, Elena Vassio & Johanna Kovar-Eder

**Contact email address:** abruch@senckenberg.de

**Purpose:** Standardized methods for vegetation reconstructions are crucial tools to obtain comparable results for fossil floras from different regions and independent from the scientist using the method. Regional or global vegetation reconstructions are a base for as different objectives as landscape reconstructions or climate modeling. Depending on the scale of the objected vegetation unit to be reconstructed, a method has to meet special preconditions and therefore can vary considerably in its theoretical setting.

Several methods were developed during the last years which are based on different philosophies (taxonomic or physiognomic) and approaches (semi-quantitative to statistical), cover different spatial scales of the reconstructed vegetation units (local, regional, or global), or rely on different fossil plant remains (macro or micro floras). Each of those has specific advantages for specific scientific applications.

Our symposium aims to give an overview to the state of the art of methods available and their latest developments. It is NOT meant to be a competition to find “the best method” but to stress the necessity of standardized vegetation reconstructions, to promote their application, and to provide a tool box for various crucial scientific questions.

(SS18) Progress and future direction in automated palynology

**Organizers:** Katherine Holt & Keith Bennett

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**Purpose:** Nearly all branches of palynology require the palynologist to spend countless hours at the microscope recognizing, identifying, counting, measuring and describing pollen. The needs and prospects for automation of palynology were first heralded in the 1960’s, but after 50 years of continuing technological advancement, virtually all pollen counting is still done manually.

However, in more recent years there have been an increasing number of groups working towards automation of various aspects of palynology and the field is starting to see some genuine progress. In this session we will draw together those groups who are actively involved in developing methods to partially or completely automate any aspect of the pollen-counting process. The primary purpose is for those involved in automated palynology to share ideas and advancements between groups and to expedite the development of a robust, reliable automated pollen counting and classification system.

Of equal importance, will be presentation of the state of play of automated palynology to all branches of the palynology community, and to demonstrate that automated palynology is achievable and has the potential to deliver significant benefits in terms of time savings, more accurate counts, repeatable counts, larger counts, and high taxonomic resolution.

All branches of palynology stand to benefit from partial or complete automation of the palynology process, so the proposed session will be of interest to all those who attend the conference.

(SS22) Application of digital visualization methods to advance paleobotanical studies

**Organizers:** Selena Smith & Margaret Collinson

**Contact email address:** sysmith@umich.edu

**Purpose:** Tomography, or imaging by section, has a long history in paleobotany, especially in the reconstruction of plants preserved as petrifactions (e.g., coal balls). The use of computers has improved visualization in long established methods such as serial-grinding, serial-sectioning and serial peeling. Further innovations have come from novel imaging techniques such as non-invasive and therefore non-destructive methods (e.g., synchrotron radiation x-ray microscopic tomography, microscopic x-ray computer tomography, confocal laser scanning microscopy, Raman imaging, laser scanning). These methods are of particular interest in researching fragile, unstable or unique specimens and microfossils and provide a novel way of visualizing fossil plants and understanding morphology. This symposium will provide a forum for a technical overview of a wide range of selected methods, highlighting recent technical advances, advantages and disadvantages, and the application of these methods to various types of preservation. Examples will be given to show how
these 3D visualization techniques provide insight into structures and morphologies that would otherwise remain unknown – information that can be crucial to accurate taxonomic and paleoenvironmental interpretations.

(SS26) Advancing High-Resolution, High-Throughput Research in Paleoecology
Organizers: Surangi W. Punyasena & Feng Sheng Hu
Contact email address: punyasena@life.illinois.edu
Purpose: This session brings together researchers in palynology and paleobotany that are developing novel methods that seek to fundamentally transform the nature of paleoecological research. We focus on approaches designed to provide high-resolution, quantitative analyses of paleoecological, paleoclimatic, and biostratigraphic data using new computational techniques, microscopic methods, genetic analysis, and biogeochemical advances. These methods aim to expand the hypotheses that can be addressed in palynology and paleoecology by increasing the taxonomic, temporal and spatial resolution of paleoecological data across both Quaternary and pre-Quaternary timescales.

(SS41) Ecological insights from palynological and macrofossil analysis
Organizers: Simon Brewer & Thomas Giesecke
Contact email address: simon.brewer@geog.utah.edu
Purpose: Palaeoecology offers the long time-perspective to ecological processes. However, ecological theory continues to be seldom addressed with palaeoecological data. While experiments are difficult to design as we reconstruct processes that have already occurred, hypothesis can be tested for example by using multiproxy datasets, comparing several datasets of the same proxy or selecting a site in a specific location with a known history of environmental change. The need to evaluate the impact of global change scenarios on the natural environment requires an understanding of processes and changes occurring over long time periods and palaeoecology is in a unique position to provide a long-term perspective of how ecosystems respond to environmental shifts. Palaeoecological data can and have demonstrated the introduction and spread of alien species, the postglacial recolonisation of previously glaciated terrain. They show examples for non-linear responses to environmental change past rates of ecosystem change as well as ecosystem stability in the face of well-documented environmental changes. Also the concepts of ecosystem resilience, alternative stable states and tipping points are equally relevant to palaeoecological data. Thus we invite contributions where palaeoecological data is used to test or explore ecological theory. This may include meta-analysis as well as single site studies as well as reviews and theoretical contributions.

3. History of human-plants relationship

(SS29) Use and management of plant resources in prehistoric periods in East Asia
Organizers: Shuichi Noshiro & Yuichiro Kudo
Contact email address: noshiro@fpri.affrc.go.jp
Purpose: Human interaction with plant resources in prehistoric periods has been clarified dramatically in Japan and adjacent areas during the last ten years. We now know that the people in those periods were not plain hunter-gathers, but did manage plants resources around settlements and used them variously. In this symposium, we review the recent research results mainly carried out in Japan and deal with relevant environmental changes and use of various plant materials including timber, fruits, seeds, tubers, fibers, and lacquer, also touching upon introduction of plants from adjacent areas. Besides these reviews, we would like to present prospects for future research including topics such as identification of origins of plants and plant materials.

(SS31) Palynological evidence of past traditional farming systems and pastoralism
Organizers: Jean Nicolas Haas & Didier Galop
Contact email address: Jean-Nicolas.Haas@uibk.ac.at
Purpose: Since the last two decades Non-Pollen-Palynomorphs (NPPs) get increased attention by
Quaternary palynologists due to their ubiquity in all kinds of habitats and their abundance in different sediment types, where they sometimes exceed the total number of pollen and spores. Algal cysts, fungal spores, trichomes, parasite eggs and/or zoological remains such as Neorhabdocoela eggs, among others, do therefore greatly add to our understanding on the evolution of former ecosystems worldwide. Together with classical palynological studies using pollen and cryptogam spores, NPP-microfossils such as spores from coprophilous fungi or nutrient indicators such as cyanobacteria and dinoflagellate cysts clearly add to our knowledge on past traditional farming systems and pastoralism, and may in turn – together with other palynological methods and proxies to be discussed and presented during this IPC session – help disentangling plant and animal diversity changes due to climatic change or human impact.

(SS35) Environmental and cultural dynamics of the last 21,000 years, with emphasis on prehistorical agriculture in East Asia and other places of the world
Organizers: Wei-Ming Wang, Hikaru Takahara & Sangheon Yi
Contact email address: wmwang@nigpas.ac.cn
Purpose: It is assumed that global Neolithic culture including original agriculture was generally formed some 12,000-10,000 years ago. The global climate of the last 21,000 years exhibits dramatic changes and abrupt events. It inceptioned with the end of the latest glaciations, and simultaneously with the transition between the Paleolithic and the Neolithic, when culture of a hunting-gathering mode tended to qualitatively change into an agricultural society. This session aims to present new developments to build an interdisciplinary synthesis for environmental and cultural dynamics, integrated cultural contexts, and high-resolution climatic and vegetation frameworks. This session will specially focus on some major climatic events, such as the Younger Dryas, the Holocene Megathermal, providing evidence for changes in environments, ecosystems and others that affected the regional development of agriculture.

4. Quaternary ecosystems and climates
(SS04) Tropical coastal environments: Drivers and consequences of ecological change in the late Quaternary
Organizers: Ulrike Proske & Hermann Behling
Contact email address: ulrike.proske@anu.edu.au
Purpose: Coastal ecosystems, such as peat forests, mangroves and salt marshes, play a key role along tropical shorelines. Due to their position as link between the terrestrial and the marine system, these ecosystems are known to prevent the erosion of sediments and thus stabilise coastlines, dampen the impact of storm surges, cycle nutrients, store carbon and provide a unique habitat for numerous marine and terrestrial organisms. Throughout the late Quaternary changes in a variety of local, regional and global parameters as well as human impact forced these ecosystems to adapt constantly to new environmental conditions. The continuous reconfiguration of these ecosystems is reflected in their biodiversity pattern and the variance of their spatial extent, which in turn had consequences for the coastal system as a whole. This session welcomes contributions from scientists researching the palaeoecology and palaeoenvironment as well as drivers and consequences of ecological change in pan-tropical coastal ecosystems.

(SS05) Late Quaternary environments in Southeast Asia
Organizers: Janelle Stevenson, Ulrike Proske, Zhen Li & Thi Mai Huong Nguyen
Contact email address: Janelle.Stevenson@anu.edu.au
Purpose: Southeast Asia hosts a wide range of ecosystems, from montane rainforest to coastal mangroves. Throughout the late Quaternary these ecosystems were subjected to drastic changes in environmental conditions which acted on different temporal scales (millennia to decades) and were controlled by global (e.g. sea level and climate) and local drivers (e.g. fire, alterations in geomorphology and human activity). These fluctuations in environmental parameters induced
profound changes in the landscape leading to spatial and compositional adaptations of the different ecosystems. By investigating late Quaternary palaeoecological records, drivers and feedback mechanisms of ecological change become apparent which allow us to better understand ecosystem dynamics under changing environmental conditions.

This symposium invites contributions investigating the development of late Quaternary landscapes throughout Southeast Asia. It aims to bring together researchers investigating spatial and ecological ecosystem evolution and the drivers behind environmental change.

(SS06) "Into the Icehouse" climate and vegetation change at the end of the Pliocene (a joint ROCHEEH and NECLIME symposium)

Organizers: Torsten Utescher & A. Angela Bruch
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Purpose: The drastic global change from Neogene warm to Quaternary ice house climate took place to a large extent during the Pliocene. Marine records give evidence for a globally severe cooling and/or increasing aridity during Pliocene and towards the Pleistocene. There is evidence from various palaeobotanical records that this change involved a distinct loss in biodiversity, and for the first time, plant associations are recorded that are close to modern ecosystems. However not many details are known yet about the spatial and temporal distinctions in terrestrial climate evolution, influencing the vegetation cover differently in different parts of the continents.

Our symposium aims to discuss the late Pliocene to early Pleistocene terrestrial climate record, its spatial differentiation and influence on vegetation development. Contributions to quantitative vegetation and climate reconstructions based on all kinds of plant fossils, macro remains as well as pollen, and from all parts of the world are welcome to provide an overview of temporal and spatial changes at the Pliocene/Pleistocene transition.

(SS16) Holocene Palynology and Tropical Palaeoecology

Organizers: Navnith K.P. Kumaran & Ruta Limaye
Contact email address: kpnkumaran@gmail.com
Purpose: Holocene epoch represents the last 10,000 years of earth’s history. There have been dramatic changes in sea level and climate during this epoch. The present landscape and ecology have been substantially modified as a result of Holocene events. Generation of bio-georesources has also been seriously affected due to climate and anthropogenic changes in the recent past. There is considerable concern on the changing scenario of the monsoon pattern and its effects on the vegetation in the tropics. The phenological pattern, pollen production and dispersal aspects can be decoded using the preserved pollen as signatures in the sediments. Since Holocene constitutes the latest geological epoch and also concerned with our environment in which the interactions of both the biosphere and Geosphere, application of Palynology will be an effective tool to understand how the vegetation responded to climate change/monsoonal variations. Considering the immense potential preserved in the marine and terrestrial sediment archives, the vegetation dynamics of the Tropics during the Holocene is to be focused in the proposed symposium.

This session welcomes contributions from scientists working on Holocene Palynology and vegetation dynamics with special reference to aspects of Tropical Palaeoecology.

(SS24) Detection and characterisation of millennial-scale climate variability in Quaternary pollen records (INQUA IFG ACER symposium)

Organizers: William J. Fletcher & Maria Fernanda Sanchez Goñi
Contact email address: will.fletcher@manchester.ac.uk
Purpose: Millennial-scale variability is increasingly recognized as a recurrent feature of Quaternary climates. Following more than a decade of intensive research into Dansgaard-Oeschger cycles and Heinrich events of the last glacial, it is clear that palynology has a vital role to play in understanding biosphere responses to millennial-scale variability and in constraining spatial variability in the impacts of this variability. These insights can lead in turn to better understandings of the underlying mechanisms and drivers of millennial-scale climatic changes. We welcome contributions related to the investigation of millennial-scale climatic variability in palynological records, in particular related
to: palynology as part of multiproxy investigations of long terrestrial or marine sediment sequences; constraining the timing and nature of millennial-scale variability during the last or earlier glacial-interglacial cycles; vegetation-climate interactions on millennial timescales. This symposium is part of the activities of the INQUA International Focus Group ACER (Abrupt Climate Changes and Environmental Responses).

(SS25) Late Cenozoic to modern marine palynology of the circum-Pacific Ocean
Organizers: Fabienne Marret, Anne de Vernal & André Rochon
Contact email address: f.marret@liv.ac.uk
Purpose: Over the last decades, deep-sea sediments from the Pacific have revealed the strong potential of marine palynology to reconstruct past environmental changes on long- and short terms. For instance, the NE side of the Pacific has been relatively well investigated for the recent distribution of dinoflagellate cysts as a tool for past sea-surface reconstructions. Longer records are also available, combining pollen and dinoflagellate cysts, enabling a comprehensive picture of the regional climate dynamics. However, the Pacific Ocean is still understudied compared to the Atlantic Ocean, although it is an important component of the global atmospheric-ocean coupled system. The biological affinity of many palynological taxa from the Pacific still needs to be documented. Moreover, there are modern organic-walled dinoflagellate cysts that are endemic to the Pacific Ocean (for ex., Dalella chathamense, Echinidinium spp.). Therefore, it is timely to shed some light on the marine palynology of the Pacific realm.

5. Cenozoic plants and biosphere surrounding them

(SS03) Uplift of the Himalaya and its impact on the climatic and biodiversity changes in East Asia
Organizers: Zhekun Zhou & Arata Momohara
Contact email address: zhouzk@mail.kib.ac.cn, zhouzk@xtbg.ac.cn
Purpose: The uplift of the Himalayas is one of the most outstanding geological events in the Cenozoic. This event has dramatically changed the geological and physiognomic aspects of Asia, and in turn has greatly affected the atmospheric circulation pattern, thus caused the onset and evolution of the East Asian monsoon system. In turn, this monsoon system has deeply impacted the East Asian biodiversity and climates from continental to local scales. Researches into these aspects have remained so hot that a great number of papers and books have been published recently. However, some key issues are still highly in debate, those of which include the details of time and rate of the uplift of Himalayas, the onset and subsequent evolution of the East Asian monsoon, and the biodiversity change under this dramatic climate change along the Cenozoic. Exploring these questions keeps an enduring attraction to paleobotanists, botanists, palynologists and geologists worldwide. The research field is very active and new findings are reported with a remarkable speed. We anticipate a number of interesting contributions to this symposium which will focus on all aspects of Palynology, Paleobotany, geology ecology, and biogeography.

(SS08) Climatically-forced vegetation changes short-termed (a NECLIME symposium)
Organizers: Andrea K. Kern & Torsten Utescher
Contact email address: andrea.kern@nhm-wien.ac.at
Purpose: Cenozoic studies around the globe allow us to draw substantial conclusions about Earth’s evolution related to climatic changes. At the very best, proxy data based spatial reconstructions considering palaevovegetation or palaeoclimatic parameters can be compared with results obtained from adequate modeling studies which are highly useful to create an overall image. However, vegetation change caused by short-term climate variability usually remain concealed due to the delimited time resolution such studies permit. Our symposium aims to discuss climate-vegetation interactions from decadal- to millennial-scale. This information is in great extent only supplied by high-frequency palynological analyses. Focusing on local vegetation dynamics climatic events and transitions can be deciphered and, if possible,
compared with other geological and environmental proxy estimations. Besides, thematic priority lies on finding a potential climate-vegetation-equilibrium of fossil plant communities as well as up to what temporal extent, changes within the studied assemblage can be resolved. Only due to a deeper understanding of past short-term events, recent and future climate change and biotic response can be conceived.

We invite all contributions referring to high-resolving, quantitative vegetation and climate reconstructions in the Cenozoic.

(SS12) East Asian vegetational responses in the critical climate change events of the Cenozoic
Organizers: Yusheng (Christopher) Liu & Cheng Quan
Contact email address: liuc@etsu.edu
Purpose: It is now clear that during the Cenozoic Era, climates have dramatically been changed both in the sea and on land. To name a few, these climatically transitional events in a descending order of geological time include the Paleocene-Eocene Thermal Maximum (PETM, aka Eocene Thermal Maximum1 [ETM1]), Eocene Thermal Maximum2, Early Eocene Climatic Optimum (EECO), Mid Eocene Climatic Optimum, Eocene-Oligocene Transition (EOT), Mid Miocene Climatic Optimum, and Early Pliocene Warming Period. The formation of modern vegetations on Earth has been a product of environmental change and biotic response during the Cenozoic. East Asia occupies an important portion of land in the Northern Hemisphere and is a home to a great number of Tertiary relicts. Therefore, Cenozoic (micro- and mega-) plant remains in East Asia provide essential materials to be studied to better understand how the responses of diverse vegetations to the dramatic climate changes could be. Although much work still remains to be done in East Asia, East Asian Cenozoic Paleobotany has achieved much progress in the past decade. This symposium aims to combine the efforts of paleobotanists and alike worldwide who are interested in the geological history of East Asian vegetations to get insights on the East Asian vegetational responses in the critical climate change events of the Cenozoic.

(SS14) The evolutionary history of conifers that are now endemic to Asia
Organizers: Atsushi Yabe & Ben LePage
Contact email address: a.yabe@dinosaur.pref.fukui.jp
Purpose: Most of the conifer genera that are now endemic to Asia were once distributed widely across the different continents in the Northern Hemisphere during the Quaternary, “Tertiary,” and even Cretaceous. Despite the large amount of fossils that have so far been described, the evolutionary history of these paleoendemics, biogeographic dispersal patterns, and habitats of these early representatives are still not well understood. This symposium is intended to synthesize the current advances in the study of these conifers that are now endemic to Asia to better understand their evolutionary history. The symposium will include systematic relationships, ecology, phytogeography, and any other topics related to these conifers.

(SS17) Palaeoecology of Cenozoic conifers – limits of actualisms?
Organizers: Lutz Kunzmann, Martina Dolezych & Wilfrid Schneider
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Purpose: Cenozoic conifers are often regarded as crucial for reconstructing of ancient ecosystems including lignite-forming swamp vegetation and mixed broad-leaved polar forests. The purpose of this symposium is to elucidate methods for palaeoecological investigations and to evaluate their validity for the reconstruction of palaeoecosystems. Special focus will be on:
(1) Taphonomical investigations: Plant taphonomy has a great potential for palaeoecological reconstructions. In-situ plants and (par-)autochthonous assemblages provide a direct insight into the structure of the ancient phytocoenoses.
(2) Vegetational reconstruction: Cenozoic conifers are common in zonal mesophytic forests of nearly all palaeolatitudes as well as in azonal vegetationtypes including swamps and riparian forests. Not all of the fossil conifers may provide decisive environmental information based on the ecological requirement of the next living relative species. Autecology of present-day species that are typical relics surviving in niches do often not match the habitat of their Cenozoic ancestors. The
interpretation of autecology of extinct taxa is of particular interest.

(SS30) Late Cretaceous and Tertiary Woods. Ecological, Systematic, and Biogeographic Insights from the Fossil Wood Record
Organizers: Kazuo Terada, Kyungsik Kim & Elisabeth Wheeler
Contact email address: k-terada@dinosaur.pref.fukui.jp
Purpose: Variations in growth ring structure and features of tracheary elements provide information about environmental conditions. Analyses of Late Cretaceous and Tertiary woods of both the Southern and Northern Hemispheres yield data important for understanding the responses of woody plant structure and distribution to environmental changes. Careful determination of the systematic affinities of fossil woods to extant plants is important to biogeographic studies in revealing past distributions of woody plants.

(SS37) The flora of the Paleogene: diversity, distribution and regional to global responses to changing climates
Organizers: Carlos Jaramillo, Diana Ochoa & Monica Carvalho
Contact email address: jaramilloc@si.edu
Purpose: The (shifting) warm-to-cold climates of the Paleogene seem to correlate with plant dispersal and diversification during the initial stages of the Cenozoic. This symposium aims to present a scenario to 1) integrate the latest discoveries from Paleogene floras around the world; 2) evaluate the responses of vegetation to long-term climate fluctuations; and 3) discuss past distribution and biogeographic patterns, in search of potential commonalities in dispersal routes across tropical and temperate plant lineages. A proper review and integration of worldwide Paleogene floras will help to better understand local and regional geographic and climatic features that influenced plant dispersal, as well as the post K/Pg boundary recovery and the initial diversification of early Cenozoic floras that established the onset for modern biota. Finally, the data brought to this symposium will contribute an adequate state of art on which to base testing hypotheses derived from phylogeographic and biogeographic inferences of modern taxa.

(SS42) Neogene global tectonic and climatic change as drivers in plant evolution: linking the palynological, paleobotanical and molecular records
Organizers: Carina Hoorn, Andres Pardo & Alexandre Antonelli
Contact email address: M.C.Hoorn@uva.nl
Purpose: The Neogene period represents the transition to our modern world, when crucial geographical features such as topographic relief, drainage patterns and oceanic currents were laid out. It also represents the run-up to the ‘icehouse’ world with final bleeps of a ‘greenhouse’ during the Middle Miocene (c. 15 Ma) and Middle Pliocene (c. 4 Ma). The combined effects of global tectonic and climatic change was critical for floral and faunal evolution, but also determined present biodiversity patterns, particularly this latter aspect was only identified by scientists in recent years. Interdisciplinary studies that include the geological history, palynology, paleobotany and molecular phylogeny potentially can offer new insights into our understanding of plant evolution and diversification. In this session we encourage palynologists, paleobotanists and molecular biologists who work at the interface of their disciplines to present their research on the Neogene evolution of plants and algae in geologically dynamic regions from all over the globe and from both marine and/or continental settings. The insights gained from this type of research are relevant when modeling the impact of future climatic change, but also where it concerns drafting guidelines for conservation policies in regions of high biodiversity.

6. Phytogeography and systematics of Palaeozoic and Mesozoic plants

(SS21) Paleofloristic and palaeoenvironmental changes in Asia throughout the Mesozoic: palynological and megafossil evidence
Purpose: Paleobotany of the Mesozoic period is a rich and expanding field of research in Asia. Cross studies on macro- and microremains in various fields of research such as palynology, xylology or cuticular anatomy bring new advances in the understanding of past ecosystems and climates. Several models of paleofloristic provinces have been suggested for Asia, and a variety of point of views allows discussion concerning its biogeography and the relations between its components, as well as a global comparison. Moreover, Mesozoic also includes the key period of Angiosperm diversification and worldwide expansion, and Asia has important clues to discover what happened at the beginning of the "vegetational revolution".

(SS33) Southern Hemisphere floras: unique insights into the biology and ecology of Southern Hemisphere ecosystems
Organizers: David Cantrill & Stephen McLoughin
Contact email address: David.Cantrill@rbg.vic.gov.au
Purpose: Palaeobotanical research has largely been focused on Northern Hemisphere sequences resulting in an unequal distribution in our knowledge of fossil biotas. Within the Southern Hemisphere are several key deposits, some better known than others, which reveal exquisitely preserved plants. With detailed investigation these deposits provide the opportunity to reveal information about the biology and ecology of Southern Hemisphere ecosystems through geological time. This symposium aims to raise awareness in particular to these deposits in order to stimulate further research.

(SS34) Evolutionary history of key taxa and phytogeography of the Jurassic and Cretaceous floras of Eurasia
Organizers: Lina Golovneva & Alexey Herman
Contact email address: Lina_Golovneva@mail.ru
Purpose: This symposium is devoted to the latest achievements in researching of the diversity and distribution of key taxa which determined the evolution of the Jurassic and Cretaceous floras and phytogeographic differentiation of Eurasia during late Mesozoic. The main topics for discussion are:
1) dispersion of early angiosperms in Eurasia and their rise to dominance in different regions;
2) extinction in late Mesozoic, mesophytic relicts;
3) centers of origin and migration routes of key taxa;
4) location of paleofloristic boundaries depending on climatic, geographic taxonomical and other factors.

(SS36) Continents before vascular plants
Organizers: Dianne Edwards, Jennifer Morris & Charles Wellman
Contact email address: edwardsd2@cardiff.ac.uk
Purpose: There is a growing body of evidence relating to both fresh water and terrestrial habitats that there were diverse communities of photosynthetic organisms growing on continents prior to the colonization of land by vascular plants. Participants include Cyanobacteria and algae, often associated in biofilms or crusts, and lichens, as well as the earliest embryophytes that show some of the characteristics of bryophytes. Evidence based on micro- meso- and megafossils, trace fossils as well as geochemical and isotopic signatures will be reviewed in the context of gradually changing lithosphere and atmosphere.
We welcome contributions involving all aspects of terrestrial landscapes and colonization before and during the early stages of the evolution of vascular plants.

(SS38) Triassic and Jurassic plants: systematics, diversity variation and environmental background
Organizers: Yongdong Wang, Mihai E.Popa, Maria Barbacka & Gaetan Guignard
Contact email address: ydwang@nigpas.ac.cn
Purpose: The Late Triassic and Jurassic time intervals record the remarkable Mesophytic plant assemblages, characterized by a variety of plant groups, such as ferns, pteridophytes and domination of gymnosperm groups. Also, the Triassic-Jurassic boundary records one of the most severe mass extinctions of the Phanerozoic, a biotic turnover which is reflected in Late Triassic and Early Jurassic floral changes. The symposium proposes to address systematic aspects related to Triassic and Jurassic pteridophytes and gymnosperms of all types, but also phytobiogeographic and phytostatigraphic problems of these time intervals. The symposium will organize oral presentations focusing on three aspects of the T-J plants: 1) to emphasis the systematics of the major plant groups during the Triassic and Jurassic period; 2) to report the progresses of biodivetsity change and turnovers across the Triassic and Jurassic boundary intervals, and to show the relationships of floral response to the T-J extinction events; 3) to report the update results on the environmental background of the Triassic and Jurassic periods based on fossil plant studies, including palaeo-CO₂, greenhouse climate reconstruction, global warming, palaeoecology and palaeoenvironment.

(SS39) Precambrian to Palaeozoic Palynology: the state of the art (CIMP-sponsored Symposium)
Organizers: Marco Vecoli & Charles Wellman
Contact email address: marco.vecoli@aramco.com
Purpose: Recent Precambrian to Palaeozoic research have witnessed the application of organic-walled microfossils (acritarchs, miospores, chitinozoans) for the solving of fundamental palaeobiological problems and for a deeper understanding of global functioning of complex ecosystems and biosphere-geosphere interactions. The use of new analytical techniques on single either in situ or isolated specimens is now providing new insights into the nature of the enigmatic Palaeozoic palynomorphs. On the whole, these new developments have had an impact also on the fundamental use of palynomorphs in the classic field of biostratigraphy, greatly expanding the potential for refinement of existing biozonations. This Symposium invites contributions on cutting-edge Precambrian and Palaeozoic palynomorph research and application to palaeoclimatic and palaeoenvironmental reconstructions, evolution of oceanic microphytoplankton, early terrestrial ecosystems, high-resolution palynostratigraphy in application to oil exploration.

7. Evolution and development in palaeobotanical contexts

(SS10) Exine development and pattern formation, unifying ultrastructural and genetic approaches
Organizers: Stephen Blackmore, Nina Gabarayeva & Michael Hesse
Contact email address: s.blackmore@rbge.org.uk
Purpose: The science of palynology is founded entirely upon the extraordinary organisational diversity and resistance to decay of the exine. Not surprisingly therefore, there has always been great interest in understanding how the complex, elaborate and often taxon-specific patterns of exine organisation are developed and have evolved. Traditionally these questions have been addressed by microscopy: first optical microscopy and later electron microscopy. There has also been a strong interest in the theoretical basis of pollen and spore symmetry control, number and placement of germination sites, and surface pattern formation. However, in spores the control of perispore (or perine) sculpturing remains poorly understood with more information urgently needed. More recently, there have been dramatic advances in the molecular genetics of pollen development based on insights from the model plant, Arabidopsis. Much of this new research has been undertaken in Japan.

The symposium aims to bring together experts from the ultrastructural, theoretical and genetic research areas in order to develop a unified understanding of exine organisation. In doing so it hopes to overcome the tendency in modern science for disciplines to specialise and diverge, each developing its own audience and terminology. Whilst the symposium will be primarily of interest to
those with an interest on the development of pollen grains and spores, the insights it generates will also assist in interpreting forms encountered in palaeopalynological or systematic investigations.

(SS11) Paleozoic Plant Physiology
Organizers: Walton Green & Cindy Looy
Contact email address: wagreen@bricol.net
Purpose: Since their disciplinary origins, paleontology and paleobiology have been concerned with basic questions of uniformitarian onus: whether the past should be assumed to be the same as the present (unless proven otherwise) or whether, if some changes have been observed, comparable changes in variables that cannot be directly observed should be assumed. Physiology is a particularly difficult area in this regard because it is seldom directly observable without experimental manipulation. In this session we hope to foster a debate about what characteristics of physiology should be considered constant throughout the Phanerozoic and when an 'upward outlook' and receptivity to non-analog arguments is needed. Our focus will be on Paleozoic plant ecosystems, but we welcome contributions from different eras, organisms, or ecosystems that are thematically related to the question of what is uniform about physiology.

(SS13) Bridging the Gap between Palynology and Phylogeography: From Ice Core Genetics to Lakebed Sediments
Organizer: Lynn Anderson-Carpenter
Contact email address: landersn@umich.edu
Purpose: The merging of disparate scientific fields can provide the most exciting and challenging aspects of research. The combination can often give new results and solve long-standing questions that neither field could address alone. For example, the combination of ancient DNA and palynology can provide taxonomic identification for morphologically similar species. Differentiating these species can often give a finer-scale resolution of shifting geographic ranges. Additional investigation can elucidate genetic change over time and give insight to implications for organismal response to shifting climates. This research is not without its challenges, and the technical implications must be addressed in parallel with this new data. For example contamination is a constant problem, particularly as DNA concentration tends to decrease with increasing sample age.

The purpose of this session is to bring together ancient DNA with the fields of palynology, paleoecology and phylogenetics. We will address a wide variety of topics including the combination of contemporary genetic patterns with paleoecological data, a DNA analysis of pollen and sediments, ice core genetics, and the combination of paleobotanical models with contemporary genetic data. Such mergers are well suited to tackle a variety of questions that are certain to provide an entertaining and informative discussion.

(SS32) Evolutionary novelties in Land Plants and developmental mechanisms behind
Organizers: Toshihiro Yamada & Harufumi Nishida
Contact email address: tyamada@kenroku.kanazawa-u.ac.jp
Purpose: Land Plants innovated their body plan since the invasion of the land. Such innovations include acquisition of elaborated sporophyte, multicellular apical meristem, leaf, integument, carpel, perianth, and so on. In this symposium, we will discuss how developmental mechanisms responsible for these innovations were evolved in light of palaeobotany. We also welcome perspectives from developmental biology which "predict" future palaeobotanical findings.

(SS40) Tracing the history of extant angiosperm clades with paleobotanical data
Organizers: Steven Manchester & Kathleen Pigg
Contact email address: steven@flmnh.ufl.edu
Purpose: Fossils showing the diagnostic characters of various living angiosperm families and orders provide important insights into such aspects of evolutionary history as character evolution, minimal ages of divergence and former biogeographic patterns. Although some families are well known from the fossil record, new evidence has only recently emerged for other groups that are rarely preserved
or seldom recognized. Our purpose is to bring to light the results of recent and ongoing studies that trace the fossil history of angiosperm clades that have received only limited paleobotanical study in the past. Contributions to this symposium will emphasize such areas as new systematic data, new understanding of clade divergence time, paleobiogeography, and/or the particular obstacles inherent in the study of a given taxonomic group.

8. IOP presidential symposium (Invitation only)

(SS23) IOP Presidential Symposium: new concepts and discoveries in plant paleontology
Organizers: Gar Rothwell & Ruth Stockey
Contact email address: rothwell@ohio.edu; rothwelg@science.oregonstate.edu
Purpose: This symposium focuses on important new concepts and discoveries in the areas of paleofloristics, systematics, and phylogeny over the past decade, by the current and past IOP Presidents as well as important contributors to the development of the field from around the world. The purpose is to highlight the breadth of new approaches and conceptual advancements that currently are, or recently have been developed in the field.