Dr Jason Hilton PhD

Reader in Palaeobiology
Deputy Director of Education, Earth Sciences

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About

Dr Hilton is a research focused palaeobotanist and evolutionary plant biologist with interests in palaeoenvironments and palaeoecology. His underlying goals are to increase the quantity of paleobotanical data included into evolutionary analyses and to provide a more detailed understanding of the past environments and climates in which fossil plants lived. He has a broad background in Geobiology and Earth Systems Science, and is an active researcher across a number of fields closely allied to his specialisation. Jason is an Associate Editor for **Palaeontologica Electronica (http://palaeo-electronica.org/)**, member of the Editorial Advisory Committee for Acta Palaeobotanica, an Editorial Advisor for the Journal of Palaeogeography, and a Fellow of the Linnean Society of London. In 2000 he received the President's Award from the Geological Society of London for achievements in Geosciences. Jason is currently Deputy Director of Education within the School of Geography, Earth and Environmental Sciences with an oversight of programmes in Earth Sciences.

Qualifications

- BSc (University of Sheffield)
- PhD (Cardiff University)

Biography

Dr Hilton completed his PhD in Palaeozoic Palaeobotany at Cardiff University in 1996 and was subsequently employed as a Curatorial Assistant at the National Museums of Wales in Cardiff. He then became a post-doctoral researcher in palaeobotany at the Chinese Academy of Sciences in Beijing for 18 months (1998-1999) in what we believe was the first western scientist to hold a position within the Chinese Academy of Sciences. In 1999 he commenced an NERC Research Fellowship at Cardiff University which was transferred to the National Museums of Scotland in 2000 where he was appointed as Curator of Palaeobotany. Dr Hilton joined the University of Birmingham in 2003 and is currently head of academic programmes for Geology.

Teaching

Dr Hilton is one of the core members of the Earth Sciences (Geology) teaching team, and is currently responsible for programme design and delivery through his role as Deputy Director of Education (Earth and Environmental Sciences). He is module leader for the following modules:

- Year 1 Field Skills (20 credits, 14 days fieldwork)
- Year 2 Evolutionary and Environmental Palaeobiology (10 credits, lectures and practical classes)
- Year 2 Resources of the Earth (10 and 20 credit variants, lectures and practical classes)
- Year 2 Research Project Planning for Joint Honours (10 credits, lectures and small group tutorials)
- Year 3 Geology and Archaeology Research Projects (40 credits, research projects)

In addition he contributes to the following modules:

- Year 1 Topics in Geology (10 credit, essay instruction supervision, small group tutorials)
- Year 2 Geological mapping training and fieldwork (20 credits, fieldwork supervision)
- Year 3 Independent Research Projects (30 credits project supervision)
- Year 4 Advances in Geology (10 credits, research essay supervision)
- Year 3 and 4 Micropalaeontology (10 credits, lectures on pollen/spores)
- Year 1 Earth History (10 credits, lectures on Palaeozoic stratigraphy and events)
- Year 4 Advances in Geology (10 credits, research essay module)
- Year 4 Advanced Projects (60 credits, project supervision)

Jason uses a range of methods within his teaching including traditinal lectures, specimen based practical classes, field geology, small group tutorials, seminars and interactive computer classes.

Postgraduate supervision

Dr Hilton has been lead supervisor on a number of doctoral researchers at the University of Birmingham inclding:

- Dr Ben Slater (2009-2013, NERC funded project) – Fossil floras of the Prince Charles Mountains, Antarctica. Project co-supervised with Dr S. McLoughlin

(Stockholm) and G. Harrington (GEES).

- Dr Andrew Rees (2006-2012, Self funded project): 3-D reconstruction of Palaeozoic problematica.
- Dr Sarah King (2008-12, NERC funded project): Late Palaeozoic wetland plant communities: Palaeoecological, palaeobiogeographic and evolutionary significance.
- Dr Liadan Stevens (2005-2009, University of Birmingham funded project): Plant palaeobiology of late Palaeozoic terrestrial lagerstatten from Britain and China.
- Dr Leyla Seyfullah (2005-2009): Evolution and systematics of Palaeozoic pteridosperms.
- Dr Susan Hammond (2000-004,NERC funded). Progymnosperms and the origin of the seed.

Dr Hilton is interested in recruiting further doctoral researchers and post-doctoral scientists in areas that overlap with his research interests, and is especially interested in supervising research projects from overseas applicants from China and South America.

Research

Dr Hilton's research has the following five foci, but occasionally digresses into other areas including marine faunas, provenance of archaeological materials, and sequence stratigraphic studies:

Seed plant evolution and phylogeny - This research addresses the origin, early evolution, systematics, evolution and phylogeny of seed plants. Reserch includes information from both living and extinct seed plants. Recent advances include a number of research investigations on the **origin of modern conifer families (/research/activity/geosystems/projects/conifer-families/index.aspx)** .

Community Change in fossil floras - This research area includes individual projects that focus on reconstructing terrestrial ecosystems though time, and looking at the floral response to environmental change. Particular foci include wetland plant communities in the Late Palaeozoic Cathaysian floras (in collaboration with Shi-Jun Wang, IBCAS Beijing), changes in species composition and distribution over time, and key periods of radiation end extinction in the terrestrial realm in collaboration with Dr D. Bond (Hull University).

Fossil plants as biospheric indicators - This research uses fossil plants as proxies for terrestrial palaeoclimate and palaeoenvironments, and ranges from studies of Late Palaeozoic gigantopterid plants with Ian Glasspool (Chicago Field Museum), Carboniferous and Permian plant adaptation with Liadan Stevens (Natural History Museum, London), as well as research on Tertiary fossil plant assemblages with Ming-Mei Liang (Birmingham).

Terrestrial sedimentary facies and environments - This research addresses the sedimentology and sedimentary facies of fossil plant bearing successions and their correlation. Research is undertaken in collaboration with Prof. Longyi Shao and Dr Jing Lu (China University of Mining and Technology) and Dr J. Wheeley (University of Birmingham) and has recently worked on Permian land:sea transitions in South China and peat forming settings in the Mesozoic of North China.

Fossil plants from China - This research investigates exceptionally well preserved fossil ferns from China and focuses on evolutionary aspects of fossil plant morphology and anatomy, and is largely in collaboration with Prof. Shi-Jun Wang and doctoral researchers in Birmingham.

Other activities

Dr Hilton is an avid fossil collector and enjoys spending time in the field and reading, and avoiding tasks including cleaning cars and gardening.

Publications

Dr Hilton is a prolific author in his field and has authored more than 80 papers to date - the following have been published since 2010 (for older articles please see **full list of publications - PDF 51KB (/Documents/college-les/gees/staff/hilton-publications.pdf)**).

Slater, B. J., McLoughlin, S. and **Hilton, J. In press**. A high latitude Gondwanan lagerstätte: the Permian Prince Charles Mountains floras, Antarctica. Gondwana Research.

Deng, S. H., Glasspool, I. J., Dejax, J. and **Hilton, J. In press.** Pollen cones and associated leaves from the Lower Cretaceous of China and a re–evaluation of Mesozoic male cycad cones. Journal of Systematic Palaeontology. doi**:** 10.1080/14772019.2013.819817

Wang, S. J., He X. H., **Hilton, J.,** Seyfullah, L. J. and Shao, L. **2014.** Anatomy and organization of *Zhongmingella* (Li) gen. et comb. nov. from the Late Permian of China and its relationships with extinct Osmundalean ferns. Journal of Systematic Palaeontology 12: 1-22. doi: 10.1080/14772019.2012.726658

Seyfullah, L. J., Glasspool, I. J., **Hilton, J. 2014.** Hooked: habits of the Chinese Permian gigantopterid *Gigantonoclea*. Journal of Asian Earth Sciences 83: 80-90.

Lomax, B. H., **Hilton, J.,** Bateman, R. M., Upchurch, G. R.., Leitch, I. J., Cromwell, A. and Knight, C. A. **2014**. Reconstructing vascular-plant genome size through geological time. New phytologist 201: 636-644. doi: 10.1111/nph.12523

Spencer, A. R. T., Wang, S. J., Dunn, M. T. and **Hilton, J. 2013.** Species of the medullosan ovule *Stephanospermum* from the Lopingian (late Permian) of South China. Journal of Asian Earth Sciences 76: 59-69. doi 10.1016/j.jseaes.2013.07.030

Rudall, P. J., **Hilton, J.** and Bateman, R. M. **2013.** Several developmental and morphogenetic factors govern diversity of stomatal patterning in land plants. Tansley Review, New Phytologist, 200: 598-614. doi: 10.1111/nph.12406

Slater, B. J., McLoughlin, S. and **Hilton, J. 2013.** Peronosporomycetes (Oomycota) from Middle Permian permineralized peats of the Bainmedart Coal Measures, Prince Charles Mountains, Antarctica. PLOS One 8(8): e70707. doi: 10.1371/journal.pone.0070707

He, J., Wang, S. J., **Hilton, J.** and Shao, L. **2013.** *Xuanweioxylon* gen. nov.: novel Permian coniferophyte stems and branches with scalariform bordered pitting on secondary tracheids. Review of Palaeobotany and Palynology 197: 152–165. DOI 10.1016/j.revpalbo.2013.05.010

Rothwell, G. W., Mapes, G., Stockey, R. A. and **Hilton, J. 2013**. Diversity of ancient conifers: the Jurassic seed cone *Bancrosftiastrobus digitata* gen. et sp. nov. (Cupressaceae). International Journal of Plant Sciences 174(6): 937–946. DOI: 10.1086/670368

He, X. Y., Wang, S. J. **Hilton, J**., Galtier, J. Li Y. J. and Shao L. **2013.** A unique trunk of Psaroniaceae (Marattiales) — *Psaronius xuii* sp. nov., and subdivision of the genus *Psaronius* Cotta. Review of Palaeobotany and Palynology 197: 1–14. doi: 10.1016/j.revpalbo.2013.05.005

Jana, B. N., King, S. C. and **Hilton, J. 2013.** Revision of the Cretaceous fossil plant assemblage from Gardeshwar (Gujarat, India): a conifer dominated floral association from an Upper Gondwana Sequence in the West Coast of India. Journal of Asian Earth Science 73: 128–138. DOI 10.1016/j.jseaes.2013.04.021

Prestianni, C., **Hilton, J.** and Cressler, W. **2013**. Were all Devonian seeds cupulate? A reinvestigation of *Pseudosporognites hallei*, *Xenotheca bertrandii* and *Aglosperma* spp.International Journal of Plant Sciences 174: 832–851. DOI: 10.1086/670235

Glasspool, I. J., Wittry, J., Quick, K., Kerp, H. and **Hilton, J. 2013.** A preliminary report on a Wolfcampain age floral assemblage from the type section for the Neal Ranch Formation in the Glass Mountains, Texas. In: Lucas, S. G. and Spielman, J. (Eds.). The Carboniferous-Permian transition. New Mexico Museum of Natural History and Science, Bulletin 60: 98–102.

Spencer, A. R. T., **Hilton, J.** and Sutton, M. D. **2013.** Combined methodologies for three–dimensional reconstruction of fossil plants preserved in siderite nodules: *Stephanospermum braidwoodensis* nov. sp. (Medullosales) from the Mazon Creek terrestrial lagerstätte. Review of Palaeobotany and Palynology 188: 1–17. DOI 10.1016/j.revpalbo.2012.09.001

Slater, B. J., McLoughlin, S. and **Hilton, J. 2012.** Animal–plant interactions in a Middle Permian permineralised peat of the Bainmedart Coal Measures, Prince Charles Mountains, Antarctica. Palaeoecology, Palaeogeography, Palaeoclimatology 363: 109–126. DOI 10.1016/j.palaeo.2012.08.018

Ryberg, P. E., Stockey, R. A., **Hilton, J.**, Mapes, G., Riding, J. B. and Rothwell, G.W. **2012.** Reconsidering relationships among stem and crown group Pinaceae: oldest record of the genus *Pinus* from the Early Cretaceous of Yorkshire, UK. International Journal of Plant Sciences 173: 917–932.

Womack, T., Slater, B. J., Stevens, L. G., Anderson, L. I. and **Hilton, J. 2012**. First cladoceran fossils from the Carboniferous: palaeoenvironmental and evolutionary implications. Palaeoecology, Palaeogeography, Palaeoclimatology 345: 39–48.

Rothwell, G. W., Mapes, G., Stockey, R. A. and **Hilton, J. 2012.** The seed cone *Eathiestrobus* gen. nov.: fossil evidence for a Jurassic origin of Pinaceae. American Journal of Botany 99: 708–720.

Bateman, R. M., **Hilton, J.** and Rudall, P. J. **2011.** Spatial separation and development divergences of male and female reproductive units in gymnosperms, and their relevance to the origin of the angiosperms. Pages 8–48 *in*: L. Wantorp and L. Ronse DeCraene (eds) *Flowers and the tree of life*. Systematics Association. ISBN–13: 9780521765992

Slater, B. J., McLoughlin, S. and **Hilton, J. 2011.** Guadalupian (Middle Permian) megaspores from a permineralized peat in the Bainmedart Coal Measures, Prince Charles Mountains, Antarctica. Review of Palaeobotany and Palynology 167: 140–155.

King, S. E., Cleal, C. J. and Hilton, J. **2011.** Common ground between two British Pennsylvanian wetland floras: using large, first–hand data sets to assess quality of historical museum collections. Palaeoecology, Palaeogeography, Palaeoclimatology, 308: 405–417.

Seyfullah, L. J. and **Hilton, J. 2011.** Callistophytalean pteridosperms from the Permian floras of China. Palaeontology 54: 287–302.

Rudall, P.J., **Hilton, J.,** Vergara–Silva, F., and Bateman, R. M. **2011**. Recurrent abnormalities of conifer cones and the evolutionary origins of flower like structures. Trends in Plant Sciences 16: 151–159.

Stevens, L. G., **Hilton, J.**, Bond, D. P. G., Glasspool, I. J. and Jardine, P. E. **2011**. Radiation and extinction patterns in Pennsylvanian–Permian floras from North China as indicators of environmental and climate change. Journal of the Geological Society, London 168: 607–619.

Rothwell, G. W., Stockey, R. A., Mapes, G. and **Hilton, J. 2011.** Structure and relationships of the Jurassic conifer seed cone *Hughmillerites judii* gen. et sp. nov.: implications for the early evolution of cupressaceae. Review of Palaeobotany and Palynology 164: 45–59.

Wang, H., Shao, L., Hao, L. M., Zhang, P. F., Glasspool, I. J., Wheeley, J. R., Wignall, P. B., Yi, T. S., Zhang, M. Q. and **Hilton, J. 2011.** Sedimentology and sequence stratigraphy of the Lopingian (Late Permian) coal measures in southwestern China. International Journal of Coal Geology 85: 168–183.

Seyfullah, L. J., **Hilton, J.**, Liang M. M. and Wang S. J. **2010**. Resolving the systematic and phylogenetic position of isolated ovules: a case study from a new genus from the Upper Permian of China. Botanical Journal of the Linnean Society 164: 84–108.

Stevens, L. G., **Hilton, J.**, Rees, A. R., Rothwell G. W. and Bateman, R. M. **2010**. Systematics, phylogenetics and reproductive biology of *Flemingites arcuatus*, sp. nov., an exceptionally preserved and partially reconstructed Carboniferous arborescent lycopsid. International Journal of Plant Sciences 171: 783–808.

Bond D.P.G., **Hilton, J.** Wignall, P. B., Stevens, L. G., Ali, J. R., Sun, Y. and Lai, X. L. **2010.** The Middle Permian (Capitanian) mass extinction on land and in the oceans. Earth–Science Reviews 102: 100–116.

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