Paleogene floras and global change events: Introduction

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The six papers in this collection focus on Northern Hemisphere floristic changes during the Paleogene. Akhmetiev, and Kvacek cover the major fossil floras of the Palaeocene and Eocene of Russia and Europe respectively whilst DeVore & Pigg, and Pigg & DeVore cover North American floras. Krassilov *et al*. deal with Russian/North American floristic interchange, and Collinson *et al*. focus on the significance of exceptional preservation. An additional paper by Kvaček & Wilde describes new representatives of the European Eocene Malvaceae.

The Paleogene is a pivotal interval of time for both plant evolution and the development of plant communities. The plant fossil record of the Paleogene provides the evidence of vegetation responses in previous greenhouse worlds as well as recording the development of key taxa and vegetation types found in temperate regions today. Therefore, it seemed both timely and useful to have included a symposium entitled "Paleogene floras and global change events" in the 7th European Palaeobotany-Palynology Congress in Prague during September 2006 (Kvaček & Sakala 2007).

This collection of six papers represents expanded and updated treatments of seven of the eight papers presented in that symposium. Aspects of two presentations (on Messel Oil Shales and the Insect Limestone) have been combined in one paper. The eighth paper (on the Paleocene-Eocene thermal maximum at Cobham, UK) was already destined for publication elsewhere (Collinson *et al*. 2009).

Using Dieter Mai's 'Florenkomplex' system as a framework, Zlatko Kvacek describes the stratigraphic and geographic distribution of European Paleogene floras. He then groups them by vegetation type and provides the first large scale, tentative, yet critically evaluated, map of European Paleogene vegetation.

Mikhail Akhmetiev reviews the Paleogene floras of Russia and northern Kazakhstan, bringing together a valuable English language summary of the vegetation and its response to climate and seaway changes across latitudes ranging up to the Arctic circle. He provides palaeogeographic maps documenting localities and key indicator taxa for the fossil floras.

Valentin Krassilov, Tatiana Kodrul & Natalia Maslova discuss floristic interchange and continuity between eastern Asia and western North America through the Beringia connection. They focus on selected taxa including conifers of the Cupressaceae (including a new species); extinct relatives of the Platanaceae (platanoids) and *Trochodendron* and *Cercidiphyllum* (trochodendrocarpoids); and on various aquatic plants.

The major floras from North America are discussed by Melanie DeVore & Kathleen Pigg in two papers (Late Palaeocene to Early Eocene, and Middle and Late Eocene to Oligocene). They consider vegetation response to climate change and emphasise the importance of incorporating information from basinal and depositional settings into vegetation interpretation.

The paper by Margaret Collinson, Steve Manchester, Volker Wilde and Peta Hayes emphasizes the unique contribution made by exceptional preservation to our understanding of Paleogene plants and plant-animal interactions. They focus on a comparative study of fruit and seed floras from two examples – the middle Eocene oil-shales of Messel, Germany and the latest Eocene Insect Limestone of the UK.

This collection of papers on the Paleogene history of floras and vegetation will be of interest to those studying fossil faunas, modern floras and the systematics of extant plants, and the future response of plants to climate change. Palaeobiologists working with mammals, birds and insects will gain easily accessible reviews and summaries of the vegetational framework in which Paleogene animals lived. Systematists working with extant plant groups will gain a better understanding of the plant evolutionary and biogeographic events of the Paleogene and how they shaped the current plant groups under study today. The Paleogene provides climate researchers with analogues to how modern plants and plant communities may respond to elevated temperatures and carbon dioxide levels. Coupling what is known about when major global change events occurred during the Paleogene, with a better understanding of the evolutionary and community histories of plants, will lead to a clearer picture of how key plants that define communities, as well as the communities themselves, respond to global change.

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