3. Key Characters of Holotypes Revealed by µCT – Anacardiaceae

New µCT data suggest affinity with extant Dracontomelon and Pseudosclerocarya (mainly lianas), which are typical examples of tropical families in this flora.

2. Why Study London Clay Holotypes using X-Rays?

Traditional destructive sectioning is inappropriate for holotypes. µCT can generate a high-resolution, 3D dataset non-destructively, without having to remove the specimen from the silicone oil, in which it is stored to retard pyrite decay. µCT enables previously unseen internal organization to be visualized to investigate the diversity of tropical species and to resolve relationships with modern tropical taxa.

µCT Methodology

4 species of Anacardiaceae and 16 of Icacinaceae were scanned by the Nikon MicroX CT HMX ST 225 µCT system at the Natural History Museum, London. Scans were single stacks using 220kV voltage, a current of 200µA, a tungsten reflection target and a copper filter, with an exposure time of 708ms and a resultant voxel size of 7-13 µm.

Digital extraction of seed cavity infills has revealed key taxonomic characters in these holotypes. Key internal characteristics were visualized for the first time in these holotypes.

4. Key Characters of Holotypes Revealed by µCT – Icacinaceae

The Iodes corniculata holotype shows a funicle in the fruit stone wall. This feature is diagnostic of the modern genus Iodes, and therefore its presence in the fossil confirms the taxonomic placement of the fossil in this modern genus. Today, Iodes is confined to tropical rainforests of Africa, Madagascar, and Southeast Asia. The presence of this genus in London Clay flora is therefore of considerable biogeographic and ecological significance.

5. Conclusions

- Key internal characteristics were visualized for the first time in these holotypes.
- Digital extraction of seed cavity infills has revealed key taxonomic characters in encrusted specimens.
- Affinities with modern tropical families are confirmed, but generic assignments are questioned for some fossils.
- Taxonomic & nomenclatural revision may be necessary for the genera Iodes, Natsiatum and Pseudosclerocarya.
- µCT has provided a permanent record of damaged specimens, which may subsequently fall apart. µCT records can be used to monitor any future changes.

References


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• Corresponding author. E-mail address: Neil.Adams.2012@live.ruhul.ac.uk