

Digitising Kew's Herbarium: Do We Have a Protocol for That?

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Abstract

How do you get 8.5 million plant and fungal collections imaged, transcribed and online for global consumption? Digitisation staff at the [Royal Botanic Gardens, Kew](#) are currently seeking to answer this question to make the vast herbarium and fungarium collections freely available. Two years into the project and with 3.4 million collections fully digitised (as of July 2024), we reflect here on the trials and challenges faced by one team in particular, the digitisation team's curator-botanists in the herbarium.

Kew Gardens is thought to host the world's oldest purpose-built herbarium. The plant collections housed within, comprise one of the largest collections in the world—collections that underpin much of Kew's scientific research. Along with [Kew's Fungarium](#), [Kew's Herbarium](#) collections include over 95% of known vascular plant genera and 60% of described fungi, representing data collected from more than 260 years of exploration and observation.

Earlier projects have ensured the digitisation of all 330,000 type specimens and smaller, limited, family or area projects, with images and data being made available via platforms such as [Global Biodiversity Information Facility \(GBIF\)](#) and [Global Plants on JSTOR](#) (Journal Storage). The current digitisation project, running from 2022–26, ambitiously aims to create a complete catalogue of all remaining collections at Kew. Specimen data transcriptions and high-resolution images will be freely available online via the new [Kew Data Portal](#), accessible externally to researchers around the globe.

The strength of this project lies in the dedicated teams of specialists involved, including imaging experts, data managers, quality assurance specialists, and curators of the herbarium and fungarium. Staff in the role of curator-botanist (digitisation), a role created at the start of the project, function as a buffer between the high throughput image capture and the curator-botanists (collections) and researchers looking to work on the collections whilst the project is ongoing. They have become experts in multi-tasking and problem solving and have developed processes and workflows to respond to the needs of all involved. Scrutinising every herbarium folder, some that may have remained closed for years, has brought delights and complications at every turn.

At the same time, workspaces have had to be found for numerous imaging stations within the herbarium wings, allowing the imaging team to meet their targets, whilst being ever aware of the need for work space in the collections. Visitors have not been prevented from coming to Kew during the digitisation project, and the work of Kew's own researchers and curators does not simply stop. It is important to leave space available for study and curation, and microscopes accessible around the collections to ensure research can continue. The curator-botanists in the digitisation team assist heavily in the logistics planning and keep communications among all parties flowing.

Aside from the technical details, which naturally come to the fore in such a project (camera specifications, data cleaning, transcription criteria etc.), the very basics of herbaria and curation, first needed to be addressed.

Examples of the challenges met, and the solutions put forward include:

- Query: What is a standard herbarium sheet? Solution: 'Anatomy of a specimen' fact sheet produced with explanations of commonly found elements of a collection along with frequently encountered Latin phrases and abbreviations.
- Query: Shouldn't this be re-curated? Solution: Achievable re-curations pre-imaging were assessed and tackled with herbarium curators; bigger tasks were logged for later attention. Anomalies identified during imaging would remain in situ so as not to affect later processes (transcription, quality assurance).
- Query: Is a spider a pest? Solution: No...well, not usually. An identification sheet for common herbarium pests was produced with information on spiders and other non-pest herbarium visitors.
- Query: Is Sellotape archival? Solution: No, just no. A system for reporting and removing specimens in need of repair or remounting has been implemented.

The team set up regular 'exceptions' lectures and refreshers to deal with these and many other queries as they arose. In presenting these and other matters we hope to share lessons learnt and gain further insight into how other institutes have or will undertake such projects.

Keywords

collections, curation, digitisation, Royal Botanic Gardens

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Presented at

SPNHC-TDWG 2024

Conflicts of interest

The authors have declared that no competing interests exist.