# **SYNTHESYS:** Synthesis of Systematic Resources

**Europe's natural history museums and botanic gardens form a treasure trove of research resources – if you know where to locate that elusive specimen. Increasingly, institutions are working together to provide improved access to these huge natural history collections (comprising 324 million specimens in 20 institutions) but the processes are still largely uncoordinated at a European level. Continuing the work of its FP6 predecessor, the EU-funded SYNTHESYS project is improving access and usability of a system of databases and online tools to help researchers find the specimens and data they need and also locate relevant taxonomic expertise. Once researchers have located the requisite specimens, transnational access funding then helps scientists study them for real. The project is also enhancing collection management standards across Europe which will, in turn, improve future access.**

## CLASSIFYING THE CLASSIFIERS

The great natural history collections of Europe are vast, and invaluable, research resource for researchers, in particular 'systematists' – scientists who classify plants and animals – often with the aim of understanding the evolutionary relationships between groups of organisms. Almost every European capital has a natural history museum and/or botanic garden of international importance. Collectively they form a physical model of the World's biological and geological diversity. These collections allow laboratory-bound scientists to range the world and to travel in time: to collect DNA from Galapagos finches as Darwin saw them, or to study the long-extinct ancestors of modern creatures.

Gaining access to the right specimens, however, can be a challenge. Most museums have far more specimens than space to display them; the Natural History Museum in London, for example, has around 70 million specimens. Less than 1% is on display. These are maintained by just 91 staff, who deal with thousands of visitors and enquiries every year. Meanwhile, collections continue to grow, as budgets shrink.

Museums are increasingly using information and communications technologies to meet these challenges. Electronic cataloguing and digital imaging allow information to be captured and stored more easily than on traditional card indexes. But these new digital collections bring with them new storage problems to be addressed by the museum community. The SYNTHESYS project linked 20 of Europe's finest natural history museums and botanical gardens. The result is an integrated European infrastructure for researchers in the natural sciences, made up of resources that are complementary but widely distributed.

## FROM SECLUDED VAULTS TO DATABASES

Following on from the first (FP6) project, SYNTHESYS will create a shared, high-quality approach to the management, preservation, and access to leading European natural history collections. This will be achieved by providing physical access to collections of museums and herbaria (including increased accessibility to DNA within the specimens) and also the wealth of electronically stored data associated with those collections.

SEVENTH FRAMEWORK PROGRAMME

EUROPEAN COMMISSION

SYNTHESYS will provide scientists based in the EU and a number of Associated States to undertake short visits to utilise the infrastructure – i.e. the collections, staff expertise and analytical facilities – at the partner institutions for the purposes of their research. In particular, 17 partner institutions will be organised into 10 national Taxonomic Access Facilities (TAFs) where Users will be hosted by a TAF staff member. These institutions represent an unparalleled resource for taxonomic research offering collections amounting to 324 million natural history specimens, including 3.3 million type specimens, an internationally renowned taxonomic and systematic skill base, and chemical analysis, molecular and imaging facilities.

Recent advances in molecular and information technology research are already being implemented in natural history research and collections management, but there remains scope for coordinated 'quantum leaps' in both areas. SYNTHESYS will provide a sustainable framework for integration via the Joint Research and Networking Activities. The former will deliver new tools to enable Users to more efficiently extract DNA from valuable archive material. In addition, the Networking Activities will provide enhanced quality and quantity of online collections information to virtual users and will implement best practice benchmarks in collections care to raise standards and improve accessibility to many of the Beneficiaries collections for all physical users. Training in collections management will also be provided to spreads best practice across Europe.

SYNTHESYS
Synthesis of systematic resources

**Project acronym:** SYNTHESYS

**Funding scheme (FP7):** Integrating Activities (IA)

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**EU project officer:** Brigitte Sambain

**Duration:** 48 months
**Start date:** 1 September 2009
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**Partners:**
The Natural History Museum (UK)
Royal Botanic Garden, Kew (UK)
Royal Botanic Garden Edinburgh (UK)
Museum National d'Histoire Naturelle (FR)
University of Copenhagen (DK)
Museo Nacional de Ciencias Naturales and Real Jardin Botanico, CSIC (ES)
Naturhistoriska riksmuseet (SE)
University of Amsterdam (NL)
University of Leiden - Nationaal Herbarium Nederland (NL)
University of York (UK)
National Natural History Museum Naturalis (NL)
Freie Universitaet Berlin (DE)
Museum für Naturkunde (DE)
Naturhistorisches Museum (AT)
Hungarian Natural History Museum (HU)
Johannes Gutenberg University (DE)
Royal Belgian Institute of Natural Sciences (BE)
Royal Belgian Institute of Natural Sciences (BE)
Royal Holloway University London (UK)

**Coordinator:** Graham Higley, The Natural History Museum, synthesys@nhm.ac.uk

**Project webpage:** www.synthesys.info



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