

# InsectMOoD

## Insect Museum Open -omic Database

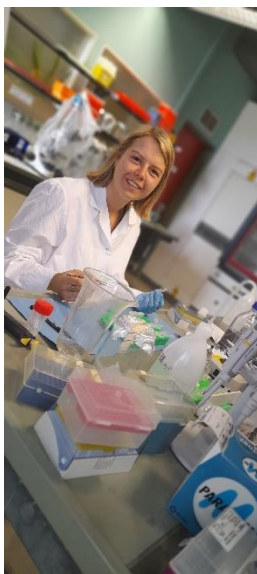
**DURATION**  
15/12/2020 - 15/03/2023

**BUDGET**  
154 784 €

### PROJECT DESCRIPTION

Museum vouchers from biological collections are of particular importance for scientific research on taxonomy, systematics and biogeography and provide tools to tackle a wide range of scientific questions in disciplines such as ecology, evolution and conservation. Collection vouchers accumulated over recent or historical times often represent the only way to access recently extinct, rare, endangered or difficult to collect species. It is well-known that museum specimens, yielding sub-optimal or low-quality DNA, are often not directly suitable for genetic / genomic analyses. Yet, the continuous progresses in genomic technologies keeps on providing new tools for the genetic characterisation of historical samples in ways that were not imaginable until only a few years ago. In this respect, an increasing number of dedicated -omic protocols for sub-optimal or ancient DNA from Museum vouchers (museomics) have been developed. Yet, even if many of the proposed methodologies allow recovering highly degraded genetic material from ancient specimens, they are often too articulated and time consuming and that they are not economically sustainable for the large-scale genotyping of museum vouchers. Hence, there is an urgent need of a pragmatic approach to the routine genotyping of suboptimal Museum vouchers, which very often represent a consistent part of the collection vouchers.

The biological collections of the Royal Museum for Central Africa (RMCA) represent valuable repositories of vouchers including an estimated amount of six million insect specimens available for research on taxonomy and systematics, biodiversity conservation, insect pest control and pollination ecology. The tephritid and syrphid collections of RMCA include more than 100,000 samples and, as a consequence of the research activities of specialized taxonomists actively involved in national and international collaborations, are among the most intensively exploited collections of RMCA. The digitalization of the RMCA insect collections has been the topic of consecutive programs and allowed converting a large number of morphological vouchers into digital vouchers that can now be accessed by a larger public. However, with the possible exclusion of the efforts made to establish a collection of DNA extracts, considerably less effort has been put in valorising their impressive bulk of genomic resources, although ready-to-use genomic data could be of great interest in the context of fundamental or applied research.



(© RMCA)

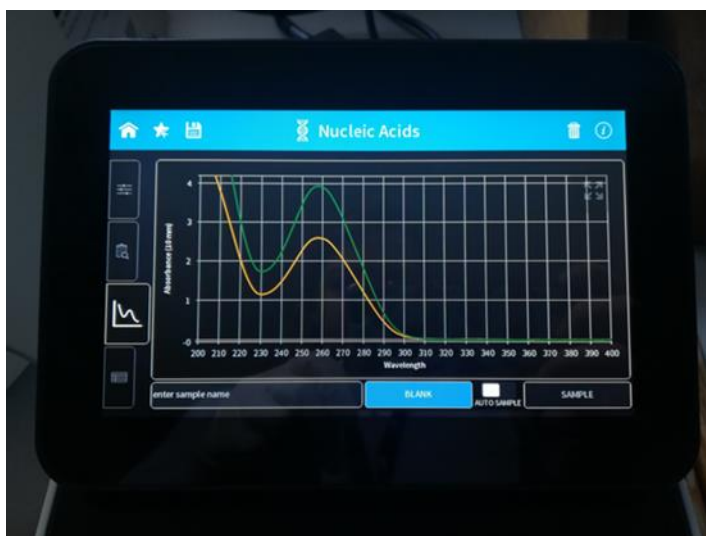


(© RMCA)

# InsectMOoD

InsectMOoD aims at promoting the large-scale genotyping of Museum vouchers as a routine preventive intervention to preserve and valorise the collection genetic resources. This approach relies on the archiving of *genomic vouchers* as a complement to the archiving of morphological and digital vouchers. In this respect, we aim at providing a test-case for the creation of genomic collections (in addition to the morphological and digital collections) as open-access, economically affordable and ready to use databases and repositories of genomic resources. In this initial phase, we will focus on hoverflies (Diptera, Syrphidae) and “true” fruit flies (Diptera, Tephritidae), two taxon groups for which RMCA has considerable taxonomic expertise and ongoing collection-based research that would promote synergies and co-financing between different projects. In this context we are developing a decision protocol for the routine genotyping of insect collection vouchers that would also be of applicable to the genotyping of different taxa.

The genomic vouchers produced will be represented by assembled genomes of collection vouchers and associated metadata (including, *inter alia*, information on protocols used for genomic library preparation and high throughput sequencing). The genomic vouchers will be linked to the corresponding morphological and digital vouchers as well as to the associated DNA collection vouchers. We aim at granting open access to the collection voucher metadata, as we believe that this would help valorising the importance of the collection genetic resources. InsectMOoD will provide a remarkable added value to the tephritid and syrphid collections of RMCA by providing a large bulk of easily accessible genetic information that could be used in the framework of ongoing and future national and international research collaborations. The optimization of experimental protocols and the collection of the genomic data will be coordinated by the Joint Experimental Molecular Unit ([JEMU](#)) of RMCA and RBINS. This project will further strengthen the expertise of the JEMU in Museomics and will generate guidelines of general interest for the WGS genotyping of material from the biological collections of RMCA and RBINS.



(© RMCA)

## CONTACT INFORMATION

### Coordinator

Dr. Massimiliano Virgilio  
Royal Museum for Central Africa (RMCA)  
Department of Biology  
[massimiliano.virgilio@africamuseum.be](mailto:massimiliano.virgilio@africamuseum.be)

### Partners

Dr. Carl Vangestel  
Royal Belgian Institute of Natural Sciences (RBINS)  
Directorate Taxonomy and Phylogeny  
[cvangestel@naturalsciences.be](mailto:cvangestel@naturalsciences.be)

## LINKS

<https://www.researchgate.net/project/Insect-Museum-Open-omic-Database-InsectMOoD>