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Taxonomy Training and Cybertaxonomy Activities at the Royal Museum for Central Africa, Tervuren, Belgium

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ABSTRACT

The policy of the Royal Museum for Central Africa (RMCA), located at Tervuren, near Brussels, in Belgium in taxonomy and in biodiversity informatics in general is presented, in order to show how early taken choices concerning collaboration were and still are beneficial for its various stakeholders. Taxonomy training for African partners and students (funded by the Belgian government cooperation) is an important aspect of this collaboration with developing countries. Secondly, the international collaboration in taxonomy and participation in networks (mostly at European Union level) of this institution is treated.

Keywords: Museum, Central Africa, Taxonomy, Training, Networking

INTRODUCTION

In 1897 a ‘Colonial Exposition’ was held in Tervuren. Among the peculiarities shown was a fish gallery with several species which proved to be new to science. This fact can be seen as the start of biodiversity research here. Nowadays, the RMCA is a Belgian Federal Multidisciplinary Institution dedicated to Sub-Saharan Africa. Taxonomy is one of its important disciplines.

TAXONOMICAL COLLECTIONS

Due to this colonial history, an important part of the ~10 million animal specimens, 60,000 tropical wood specimens of 13,600 botanical species and 20,000 (micro) fossils in the RMCA originates from the Democratic Republic of Congo, Rwanda and Burundi, independent countries since 1960. But there are also collections from other parts of Africa and from some islands in this region. The RMCA

has most of the historical zoological collections from central Africa, holding specimens from ~125,000 species and the holotype material for 26,615 insects, 543 fishes, 226 birds, 104 reptiles, 81 amphibians and 36 mammals, i.e. a total of nearly 250,000 types. RMCA has e.g. nearly half of the 3,000 type specimens in the world for African freshwater fishes. A certain number of specimens was collected on purpose in the National Parks during the colonial period, but many others were collected at random, outside protected areas.

Information on these collections was published mostly by the RMCA itself [see 1, for an example], and stored in databases (a continuing process). These collections have historically been used mostly for taxonomic reference. Their utility in this field continues and demands for tissue—to be used in molecular studies—from international partners increase; and RMCA has its own molecular biology lab. Also, there is an important use for species range modelling starting from the collections: they have

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recently been georeferenced and are mined for information about local biodiversity, predictions of distribution ranges, geographical and ecological profiles. The collections have the potential to add a historical dimension to biodiversity research [2].

In view of the international importance, there is increasing demand for access to this information, none the least from the countries of origin.

The RMCA participates much in collaboration with African partners, e.g. in the fields of:

- Conservation (example: documentation of an endangered bird, such as the Congo peacock [3])
- Development, based on taxonomical knowledge (examples: information and identification of insects as pests [4]; innovative use of spiders as bio-indicators of quality of the environment [5])
- Education (example: providing important material for handbooks [6].

TAXONOMY TRAINING

RMCA is sharing information with scientists from

Table 1 Provenance of trainees in ABIC (individual) and FISHBASE (group) at RMCA, during 2005–2007.

Countries	ABIC	FISHBASE
Benin	1	1
Botswana	1	
Burundi	2	1
Cameroon	2	2
R. Congo	1	
D. R. Congo	14	2
Côte d'Ivoire	5	
Ethiopia		1
Gabon	1	
Ghana	1	
Guinea Equatorial	1	
Kenya	3	2
Madagascar	1	
Malawi		1
Nigeria		1
Senegal	1	
Sudan		1
R. South Africa	1	
Tanzania	2	
Togo	2	
Uganda		1
Zambia	1	
Zimbabwe	2	1

African institutions by organising study visits on biodiversity, targeting both experts and doctoral students in its 'African Biodiversity Information Centre - ABIC' [7], which cover all the zoological groups and wood samples represented in its collection. These training schemes are mostly directed to individual scientists (some to technical assistants) since 2000, but specialized group training sessions (for fruit flies, snakes) will be launched soon. A yearly three-months fish taxonomy training session under the FISHBASE consortium scheme (in order to help African researchers and fishery agents gain access via the Internet to old and new literature on fish, fishery and fish farming from Africa) is already operational since 2005 [8]. Table 1 lists the number of participants in recent years. These activities are funded by the Belgian Cooperation Agency.

CYBERTAXONOMY

RMCA is also an active member within the Belgian taxonomic facilities consortium 'BETAF' (together with the Royal Institute of Natural Sciences, Brussels and the National Botanical Garden, Meise), for some biodiversity projects and in the Belgian Generalized Natural Sciences Online and Spatial Information System project, based on a decentralized solution and on Open GIS Standards. Table 2 lists some of our important international collaborative activities.

Table 2 List of participation of RMCA in major international biodiversity information networks.

International network	Role of RMCA
FISHBASE	Stakeholder for Africa
European Network of Biodiversity Information Facility (ENBI)	Leading partner of two feasibility studies, "True Fruit Flies of the Afro-tropical Region" [11] and leading partner of feasibility study "Albertaine Rift" [12]
Global Biodiversity Information Facility network (GBIF)	RMCA's xylarium was among the first Belgian collections presented
Consortium of European Taxonomic Facilities (CE-TAF)	Participant within the European Union Framework Programme V project SYNTHESYS (Synthesis of Systematic Resources) Networking & Access and Framework Programme VI EDIT (Towards the European Distributed Institute of Taxonomy)
Biodiversity Information Standards (TDWG)	Institutional member, promoting standard and interoperable scientific information sharing [see 13]

In the SYNTHESYS Network activity D [9], RMCA is active in providing collector's itinerary related datasets and tools (for integration, visualization and quality check of collection metadata).

In EDIT [10], RMCA is active within Work Package 8 'Training and Public awareness' in order to ensure the transfer of knowledge between current and future generations of taxonomists and to spread this knowledge by:

- Identifying, analysing and streamlining the training offer in Europe
- Establishing an integrated training programme (European School of Taxonomy).

and within Work Package 5 'An Internet Platform for Cybertaxonomy', for using biodiversity informatics techniques to support, give stability and provide visibility for taxonomy with the aims to increase the efficiency of the taxonomic work process and to target the user community.

Here follow some further plans of RMCA activities which will also be proposed as participation in major international biodiversity information networks:

- Digitalisation of collections (especially types) and metadata
- Facilitate dialogue and collaboration between scientists and IT departments
- Become a permanent body beyond EDIT and SYNTHESYS, notably by participation in European Union Framework Programme VII 'Life Watch'.

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