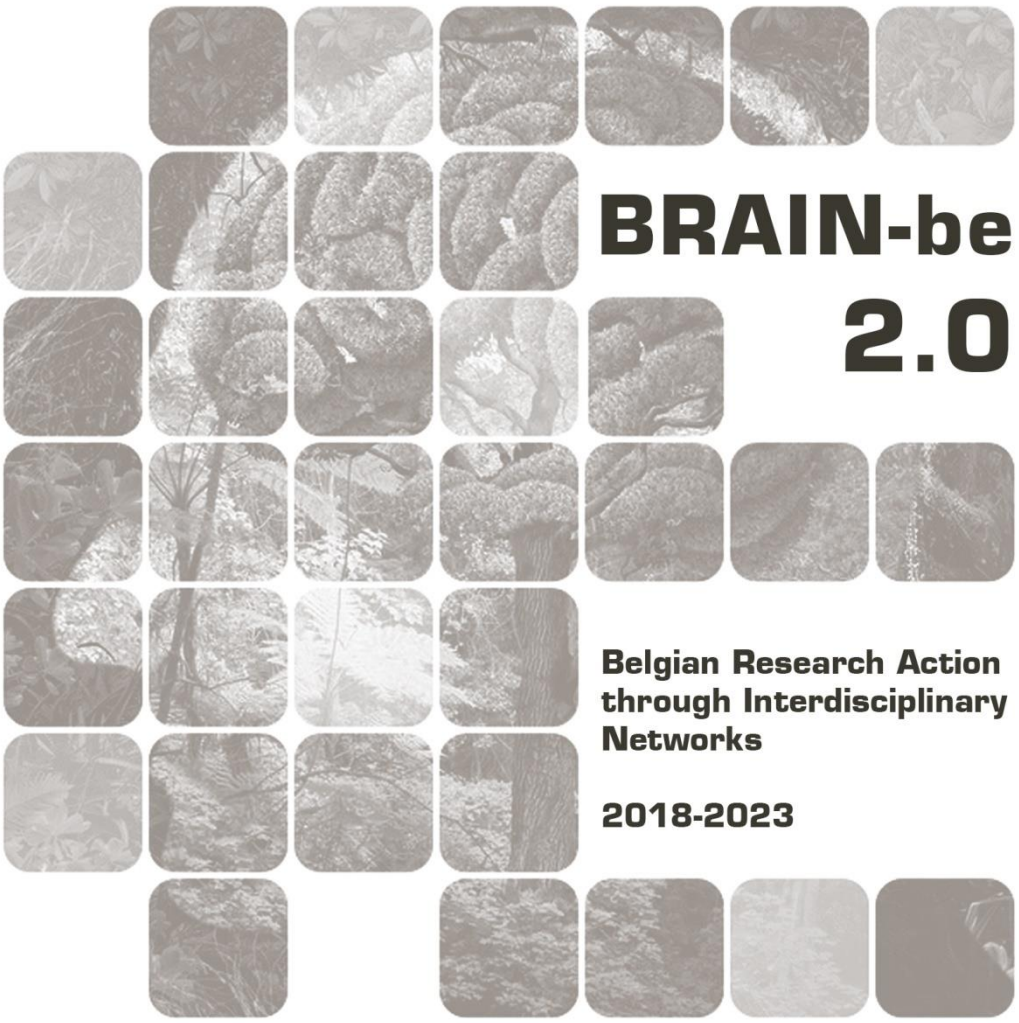

CAPTex

Towards a better appreciation of Central African Textile Masterpieces: understanding the craftwork and Preserving the collection of Textiles

Anoek De Paepe (Royal Museum for Central Africa) – Siska Genbugge (Royal Museum for Central Africa) – Piet Stoffelen (Meise Botanical Garden)

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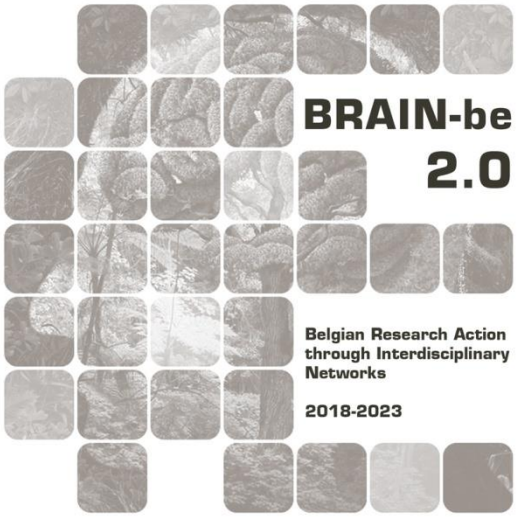

NETWORK PROJECT

CAPTex

Towards a better appreciation of Central African Textile Masterpieces: understanding the craftwork and Preserving the collection of Textiles

Contract - B2/202/P2/CAPTex

FINAL REPORT

PROMOTORS: Siska Genbugge (Royal Museum for Central Africa)
Piet Stoffelen (Meise Botanical Garden)

AUTHORS: Anoek De Paepe (Royal Museum for Central Africa)
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ABSTRACT

The textile collection of the Africamuseum was undervalued for a very long time. During the first half of the 20th century, the period during which most of the textiles in the collection were collected, very little attention was paid to textile craftmanship. This is noticeable through the limited information that can be found in the archives, acquisition files and photographs. Furthermore, the way the textiles were stored and the limited information that can be found in the collections database are telltale signs that the collection hasn't received the necessary attention.

A selection of textiles; based on materials, structures and manufacturing techniques; is examined during this CAPTex project with the aim to create an overview of the fibres and structures that can be found in the central African textile collection of the museum. This overview is shared with the larger public in an attempt to disclose the textile collection and its connecting information concerning the textile craftsmanship to a broad public: stakeholders, researchers, students, artists, etc.

An important sub-collection of the textile collection is the costume collection. From the extensive collection of mask-related costumes; 100 partial or complete costumes from different cultures, regions and periods were analysed. During the two year research project. All are created from plant fibre materials and originate from the DRC.

The main structures of these costumes could be identified as cordage, looping and braiding. All the costumes consist of loops work with relatively short lengths of corded fibres. However, there are significant differences between the costumes, differences that are mainly related to the different cultures; and even within one culture structural differences can occur.

The material and structural analyses have led to the development of an optimized conservation strategy.

1. INTRODUCTION

The unique value of the textile collections lies in the fact that most of the textiles were acquired in the first half 20th century, from collectors recorded in the museum files, with provenance often noted as well. Usually little attention was paid to the textile, fibres, manufacturing techniques or uses of individual pieces. Observers and photographers did not capture much relevant information when photographing textile crafts(wo)men at work. In stark contrast to studies of wood or metal objects, textiles made in a variety of fibres and techniques remained largely under the radar. The only historic accounts on plant fibres mainly cover the economic possibilities of certain plants and pure taxological research.

After their arrival in the museum collection, limited attention was paid to description of fibres and structures, possibly out of lack of expertise and knowledge on the topic. As a consequence, most records in the database do not have a description or a photographic record. The lack of metadata combined with the poor storage and limited physical accessibility of the collection makes the collection almost inaccessible for researchers, artists, students and stakeholders, or even for the staff scientists of the Africamuseum. An exception are the Kuba and Kongo textiles, these are the only two groups that have received a more in depth study.

A carefully selected group of costumes, based on their materials and manufacturing techniques, is analysed. The chosen garments are all made from plant fibre materials, they originate from different cultures and regions in the DRC, and all garments were collected during the 20th century. Besides dance costumes, a cape collection is added to the selection. These capes were worn by chiefs of the Kongo people as a symbol of their a high status.

The structures, techniques, materials, and degradation of textiles are analysed as they are all interrelated. A difference in fibres, their diameter, the stiffness of the cordage, and looping stitch counts results in a variety of textures, ranging from very coarse, intended, intentional combinations of thin and thick cordage in one costume. An attempt is made to develop a Central African plant fibre database in collaboration with Meise Botanical garden which will be essential for the determination of the materials of the textiles.

The Africamuseum and the Botanical garden have a parallel history and similar collecting patterns since the early 1900s due to the exploration of Congo. All the shipped unknown materials and artefacts landed in Tervuren or Brussels for identification. Botanists in Brussels described the plant material, being the start of the taxonomic study of the Central African flora, continues to this day. (Arzel 2018) Knowing and understanding of the materials and techniques will help to plan a successful passive and active conservation strategy.

A final aim of the project was to involve researchers, specialists, and textile makers specializing in Congolese textiles. Congo has a rich textile tradition that is still practiced today by many artisans and studied by Congolese experts. The involvement of Congolese textile makers and experts in Congo and in the diaspora gives the research added value, as they have a better knowledge of the materials and techniques that were and still are used, while textile conservators, advise on the best conservation and management of textiles.

96 partial or complete costumes from the extensive collection of masque-related costumes were being studied in the research project, see a list in annex D. The selected costumes are all tight fitting and cover the entire body. Different parts include long sleeved tops, gloves, pants or stockings and foot coverings. Some costumes have separate fringed skirts and ruffs. The costumes were worn with masks. Certain costumes have an attached mask, while other costumes have a separate mask which can be a wood carved mask or a mask with a base of wooden branches and twigs onto which a cover

in textile materials and techniques is created. The last ones are considered more textile than mask, they are an example of the true unity between masks and costumes, they are actually one entity. A mask comes with a dance costume and other accessories such as pagnes, flywhisks, bands with bells. (see fig. 1) Unfortunately, in the past, often only the masks were collected for their aesthetic value and the accompanying costume and accessories were deemed less important, they were made of more fragile materials, so many have not survived over time. Moreover, as empty shells, deprived to the human body, costumes lose some of their appeal. Masks, statues, sceptres do not need any support to be visually attractive and understandable.

Figure 1: Bayaka dancer. This costume is worn by the youngsters when they make their first public appearance after the seclusion period that follows circumcision. they then go to all the neighboring villages to perform a dance called "Nkanda" HP.2009.3.293, Photo Carlo Lamote (taken in 1950) (Courtesy of Royal Museum for Central Africa, Collection of Royal Museum for Central Africa, Tervuren©).

2. STATE OF THE ART AND OBJECTIVES

The major research questions of the project are: The CAPTex project to bring the understudied textile collection of the RMCA to light. Five major objectives were set for the valorisation and disclosure of the collection of Central African textiles.

2.1 IDENTIFICATION OF PLANT FIBRE MATERIALS, STRUCTURES, AND TECHNICAL PROCESSES

The first objective is the identification of the materials, structures and techniques from the textile collection of the museum. Only two out of 5320 surveyed textiles have records that describe the fibres that were used, and identifications of techniques are consistently incorrect. Researchers and collectors identified textile structures, if they took the trouble to mention them, in terms of similarity of general appearance with western objects they knew.

Unlike wood identification on masks and sculptures by Roger Dechamps (1930-1995) in the years 1970-1980, only one example of the determination of a textile fibre is found in the database. This identification was conducted by dhr. Schmitz of the Meise Botanical Garden in 1986, but unfortunately no information on the method of the determination, is recorded in the museum archive or in the Meise Botanical Garden.

In the field notebooks of Albert Alfons Maesen (1915–1992), a previous curator RMCA and doctor in art history and archaeology, the fibre of a ball of cordage is described as Mpunga with the scientific name *Urena Lobata* L.

Figure 2: Costume with identified fibre, EO.0.0.34073-1 (Courtesy of J.-M. Vandyck, CC-BY 4.0, Collection of Royal Museum for Central Africa, Tervuren©).

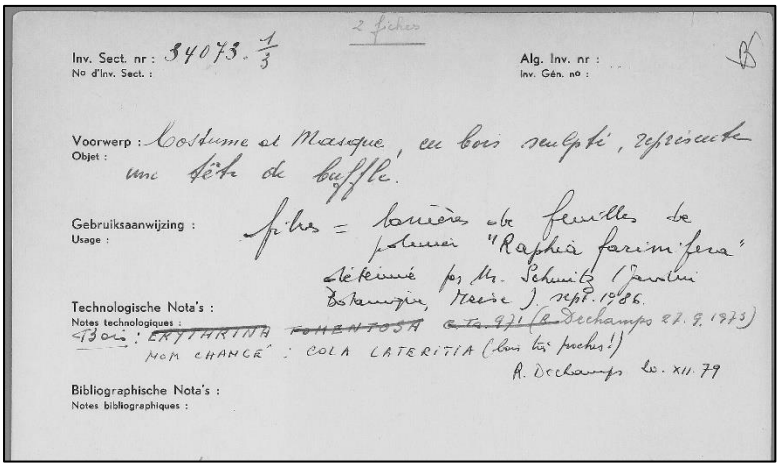


Figure 3: Fiche, EO.0.0.34073-1 (written in 1932) (Collection of Royal Museum for Central Africa, Tervuren©).

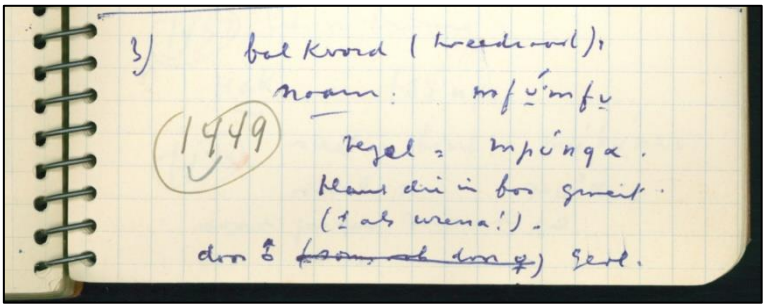


Figure 4: Fragment of field note book of Albert Maesen (Field notebook Albert Maesen no.6 p67, written in the 1950s', Collection of Royal Museum for Central Africa, Tervuren©).

Structural analysis of a selection of objects of the collection is not only useful in the context of the Tervuren collection, but also in the wider context of Congolese textiles.

Published research on Central African textile materials and techniques is dated and limited. Publications and research paid more attention for other crafts and, concerned textile techniques. The only textile techniques studied are weaving, embroidery, and the well-known *velour du Kasai*. The weaving and embroidery techniques of the Kongo and Kuba, e.g., the Kasai velours, (Coquet 1993) are more familiar to researchers and the general public than techniques such as cordage and looping, although they are the predominate technique for traditional dance costumes that are used during numerous ceremonies and they are abundantly used in masks.

These techniques are as well used in many other cultures, where it has been described by Seiler-Baldinger (Seiler-Baldinger 1995) but a connection with Congolese textiles is generally not made. An exception, the article “High-status caps of the Kongo and Mbundu peoples” by Gordon D. Gibson and Cecilia R. McGurk in a publication of the *Textile Museum Journal* from 1977. In this publication the structures and techniques are elaborated of caps from West Central Africa, these techniques have common ground with the techniques in the costumes.

A reference database that are giving an overview of plant fibres specifically for Central-Africa doesn’t exist so far. The existing databases do not elaborate the fibres and the identification, but instead their giving information about the plants themselves as the book “Plantes utiles du kongo-central, République démocratique du Congo” of Latham P. and the databases “Prota4you”, “KewScience”, and “Invasive Species Compendium” of CABI (Centre for Agriculture and Bioscience International). The existing online databases of plant fibres about the identification are: “Comparative Plant fibre Collection (CPFC)” of the University of Ohio, and “Atlas of plant material and fibres from New Zealand and the Pacific” of the University of Otago.

Little is written about the processing of plant fibres for the creation of textiles during the colonization of Congo. The first publications are handling about taxonomic work and later the publications are mainly written from an economic perspective point of view of the cultivated plants.

“Notes Botaniques Sur La Région Du Bas- et Moyen-Congo. 1 : Plantes Principales de La Région de Kisantu : Leur Nom Indigène, Leur Nom Scientifique, Leurs Usages” from *Annales Du Musée Du Congo Belge Tervuren* from, 1910, describes the botanical research of J. Gillet and E. Pâque. The work gives an overview of the plant fibres in Belgian Congo with their common name, scientific name and there usage. But the use is very briefly described. In a publication from 1936 “Les Fibres Textiles au Congo Belge” issued by Ministère des colonies an overview is given of plant fibres that are traditional intended for the fabrication of textiles but, likewise, in this publication nothing is written about the processing of the fibres. It is also written from an economic viewpoint. For each fibre the amount produced and its export value is given. In only two later publications a brief description of the technique for processing plant fibres to textile fibres is found. (Coquet 1993, 141 ; Vandeput, 1981).

CAPTex aspires to fill this knowledge gap via the development of a systematic analysis and identification of the plant fibres of a selected group of textiles. Together with Meise Botanical Gardens an attempt is made to develop a reference database with plant fibres originated from Central Africa. The database Alongside the fibre identification, the used textile techniques of the selected objects is analysed. The knowledge gained through the determination of this selection of textiles can also be exploited for research on other objects in the ethnographic collection of the RMCA in the future. Textiles, or elements thereof, have been widely used other in ethnographic object such as masks and figurines. The information obtained through the successful completion of this CAPTex will allow

identification of those textile elements and therefore further valorise the collection of Central African artefacts.

2.2 LINKING THE IDENTIFIED MATERIALS AND TECHNIQUES WITH CURRENT CENTRAL AFRICAN TEXTILE MAKING PRACTICES

The project intends to map the current central African textile making practices and link them with the observed materials, and techniques in the textile collection of the Africamuseum, by creating and consulting a network of craftsmen/women, researchers, and specialists of Central African textiles. Relating traditional and current textile practices in DRC can disclose the evolution of practices and the importance of textiles in cultural and social contexts.

Did materials and techniques changed over time? Are the traditional textiles still in use? Has the use/meaning changed? This research will also investigate if there are western influences noticeable in the technical processes of making African textiles, especially by the diaspora communities. Similar projects have been successfully carried out by Patricia Darish for the analysis of Kuba textiles and Ellen Carrlee who invited Native American Spruce Root weavers for a workshop on basketry repair (Carrlee 2020).

2.3 DEVELOPING A BEST PRACTICE FOR PASSIVE AND ACTIVE CONSERVATION OF THE RMCA TEXTILE COLLECTION

Plant fibres are very sensitive materials that can damage easily as a result to handling, light exposure and fluctuations in relative humidity and temperature. As a result, a lot of fibre objects are discoloured, deformed or broken, others are actively shedding fibres or suffer from what we call ‘baldness’, in which fibres are completely lost.

The lack of technical expertise on the textile collection at the RMCA, makes the collection more vulnerable to (unintended) damages and losses. There is a variety of literature available about the preservation and conservation of textiles (see further readings); however, these publications are mainly focused on western textiles and their technology. Reference publications on conservation of plant fibres and conservation with a focus on ethnographic materials were written over three decades ago.

Knowing and understanding the materials and techniques of an object is one of the key elements for a successful passive and active conservation strategy. Deterioration processes can be predicted, and consequently the conservator can anticipate by slowing down the process resulting in an extended lifespan of the object. Knowing the source of the plant fibre and their manufacturing processes is important to make a balanced evaluation for the right conservation treatment, whereby the risks are known and can be calculated.

The current storage conditions of the textile collection are below average: textiles are stacked in overflowing cabinets and are inaccessible. The project aims expose the damages and their major catalysts. From these results recommendations for the optimalisation of the storage and best practice guidelines for storage of different Central African textiles are developed. These recommendations can be used for other (small or big) textile collections in other institutions and private collections.

2.4 DIGITISATION AND DISSEMINATION: EXPANDING THE ACCESSIBILITY OF THE COLLECTION THROUGH ITS DIGITISATION.

More than 70% of the textiles in the collection have incomplete object records in the collections database (TMS). This makes this collection rather inaccessible, digitally as well as physically. This is a problem, since there is an increased interest in the textile collection; evident from outgoing loans to consultation requests from researchers, artists and fashion students. Improving the physical accessibility of the collection that benefits the public that can actually come to the RMCA.

CAPTex focuses on the expanding of the accessibility of the collection through the digitisation of the collection. By an adding overview and detailed photographs, together with the more in-depth knowledge of the used techniques and materials to the TMS database, the project intends to complete the object files of the studied objects and to prepare them for online publication by the RMCA.

Completed object records and digitised identification results benefits in-house researchers and improves the internal workflow for outgoing loans involving textiles, especially for international travel of textiles made from materials that fall under the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).

World wide access to the collection from around the world discloses the collection to a very broad audience and benefits the public that wants to enjoy or research the collection. The more this collection is studied, the more attention it will get from other institutions, researchers, students, artists, etc. The more attention it gets, the better it can be integrated in exhibitions, publications, thereby gaining visibility by a wider audience. As a bonus, the worldwide digital accessibility of the collection will protect the collection from unnecessary manipulation, expanding its lifespan so it can be enjoyed for generations to come.

2.5 CREATION OF AN AFRICAN TEXTILE RESEARCH NETWORK

The last goal of CAPTex concerns the creation of a network of researchers, conservators, artists and students. CAPTex purposed to bring everyone who focuses on African Textiles together and share knowledge and ideas. The focus of most relatable networking groups is too comprehensive; The International Council of Museum – Committee for Conservation (ICOM-CC) has a working group for Objects from Indigenous and World Cultures, and a working group on Textiles, The American Institute for conservation Foundation for Advancement In Conservation (AIC FAIC) has also a textile specialty group, and closer to home, ETNOCOLL a platform supported by Flemish interface centre for cultural heritage VZW (FARO) and the King Baudouin Foundation, to connect the Belgian institutions with non-European collections. Conclusively, the existing networks have a focus on either non-European objects or on a broad cultural variety of textiles.

All of the above objectives fall within the mission statement and tasks of the RMCA. The museum aspires to be a centre of research and dissemination of knowledge about Central Africa with amongst its core tasks: collection management, performing scientific research and the valorisation of the results and making the collection accessible to the broader public.

3. METHODOLOGY & RESULTS

3.1 THE SELECTION

The textile collection of the RMCA counts more than 5000 textile objects from DRC, as well as textiles originating from West-Africa, Oceania, North America and Europe. For a two year project a representative selection had to be made. The selection process started with a survey of the whole collection and its metadata to identify the hiatuses in the research of Central African textiles. Which part of the collection is already studied in-dept, and which part always remained unjustly in the shadows? What kinds of textiles can be found in the collection? Where did they originate from, who were the collectors? How did the collectors described the collected textiles? Did they describe the techniques, the fibres, the way they are used, by whom they were used? To find answers to these questions, the museum database TMS, the acquisition files, and, the archives were consulted.

3.1.1 SELECTION OF OBJECTS FOR THE RESEARCH PROJECT

a. Cultural origin of the collection

The collection varies from very large i.e. mats, *velours du Kasai*[1], to very small textiles i.e. loincloths, gloves, and, everything in between such as pagnes[2], bark cloth, costumes, and headdresses. They were collected from the end of the 19th century till the 1990s, by several collectors in the Democratic Republic of Congo and neighbouring countries.

The focus of this project is the group of textiles from the Democratic Republic of Congo. Over 50 percent of the textiles can be linked to 137 different cultures in Congo, from 48,66% of the textiles, the culture not specified in the database and it turned out, unfortunately, the information in TMS is not always correct. Kuba textiles (26,53%) are the most represented in the collection, followed by Mangbetu (3,47%) and Pende textiles (1,83%).

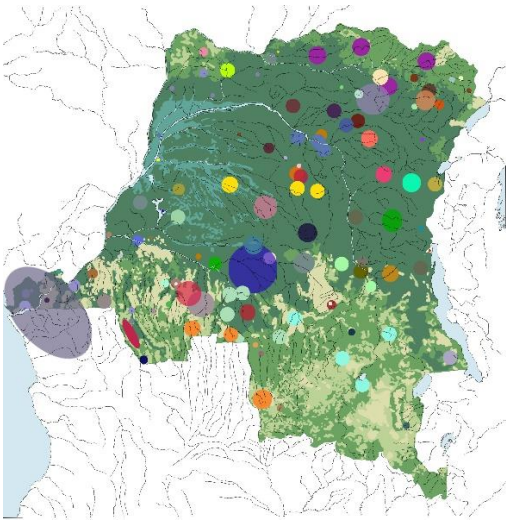


Figure 5 : Map of the origin of RMCA's textile collection

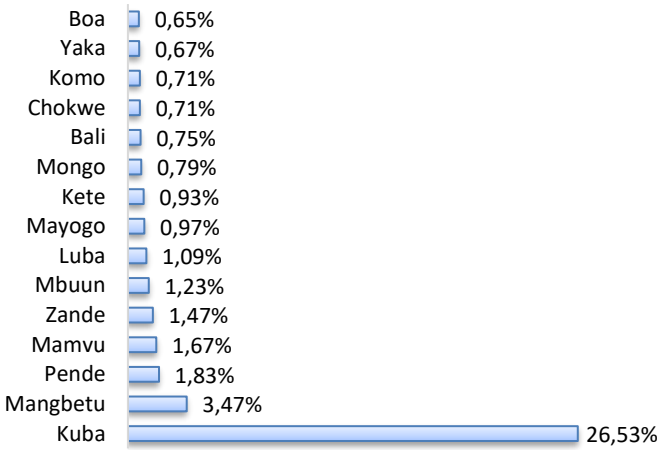


Figure 6 : Most representatives cultures in the RMCA's textile collection

[1] This type of textiles is made with plant fibers that are being woven into a flat textile with embroidered geometric figures.

[2] Pagnes are a type of skirts, they varies from fringed skirts, woven skirts with embroidery, wax printed cotton

b. Subcategories of textiles

The graphic below gives an overview of the variety of the RMCA's textile collection. Thirty types of textiles can be distinguished. Many of the textiles are described as "tissu"[3] in the database system. These textiles are classified under the denominator flat textiles, the largest group (50,05%) in the textile collection. This term is meaningless and hopefully, these textiles can be given a more function oriented term e.g. pagnes, mats, velours du Kasaï in the future. 152 of the objects could not be classified. The information in the database is very brief on these objects. Since the majority of the textiles have not been photographed and the description in TMS and the acquisition files is often not present or superficial. The only way to discover the textiles is to physically examine the objects.

The second largest group are the famous *velours du Kasai*. The origin of this type of textiles is, as the name suggests, from the Kasaï province and there are made by the Kuba.

Another large subcategory are costumes, the collection even includes complete dance costumes that were used in initiation rituals. The largest group of costumes are attributes to the Pende, Chokwe, Kuba, Mangbetu, and Yaka.

Negbwe's and loincloths in the RMCA's collection are predominantly cover Uele, a region in the Nord-east of Congo. Negbwe's are worn to cover the buttocks, loincloths covers the genitals.

Pagnes are a type of skirt worn in tropical regions and can have many forms; bark cloth, fringed skirts, to very large wrap skirt like the *Ntshaka*, a skirt worn by the Kuba.

Another subcategory of textiles are bark cloths, which distinguished by their material. Bark cloth is the inner bark that is beaten to a soft fibrous cloth.

Masks: Some masks are considered more textile than mask. These specific masks have a base of wooden branches and twigs onto which a cover in textile materials and techniques is created. These masks are examples of the true unity between masks and costumes, the mask and costume are actually one entity.

[3] "tissue" is an old term that is used in TMS to describe all kinds of fabric e.g. woven cloth, bark cloth, …

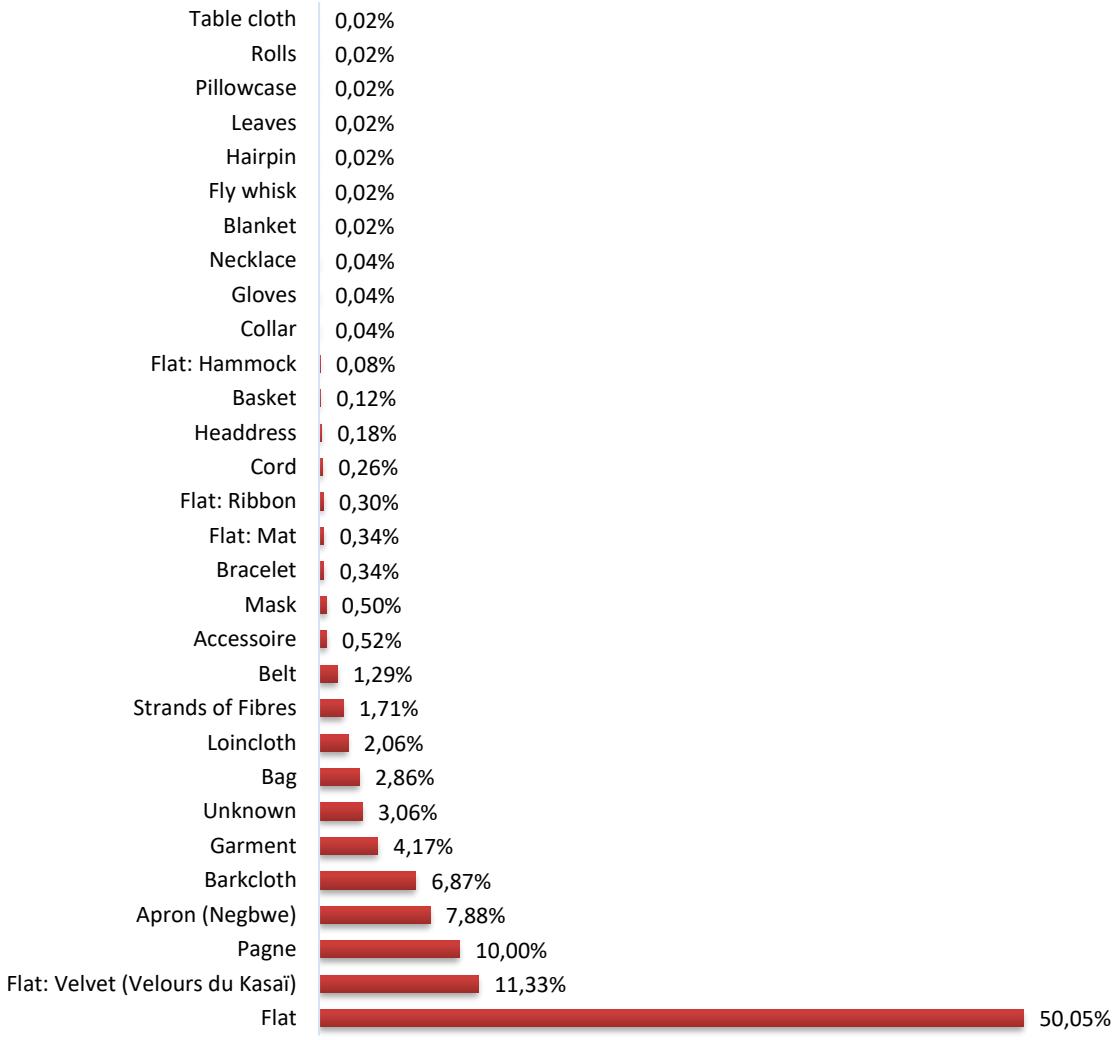


Figure 7 : The kind of textiles the RMCA collection contains

Figure 8: Bark cloth, Kuba, Collected before 1910, EO.0.0.15881 (CC-BY 4.0, Collection of Royal Museum for Central Africa, Tervuren©).

Figure 9: Loincloth, Mayogo, Collected in 1912, EO.0.0.8323 (Courtesy of J. Van de Vyver, CC-BY 4.0, Collection of Royal Museum for Central Africa, Tervuren©).

Figure 10: Pagne with fringes, Pende, Acquisitioned in 1953, EO.1953.74.4151-4 (Courtesy of A. De Paepe, Collection of Royal Museum for Central Africa, Tervuren©).

Figure 11: Bag, Mboma, EO.0.0.33467 (Courtesy of J.-M. Vandyck, CC-BY 4.0, Collection of Royal Museum for Central Africa, Tervuren©).

Figure 12: Mask, Binji, Acquisitioned in 1913, EO.0.0.15417 (Courtesy of J.-M. Vandyck, CC-BY 4.0, Collection of Royal Museum for Central Africa, Tervuren©).

Figure 13: Velour du Kasaï, Kuba, Collected in 1886, EO.0.0.17659 (CC-BY 4.0, Collection of Royal Museum for Central Africa, Tervuren©).

Figure 14: Cape, Kongo, Acquisitioned in 1921, EO.0.0.25684 (Collection of Royal Museum for Central Africa, Tervuren©).

Figure 15: Negbwe, Zande, Acquisitioned in 1912, EO.0.0.6845-4 (Courtesy of J. Van de Vyver, CC-BY 4.0, Collection of Royal Museum for Central Africa, Tervuren©).

Figure 16: Pagne, Kuba, Collected before 1910, EO.0.0.16469 (Courtesy of J.-M. Vandyck, CC-BY 4.0, Collection of Royal Museum for Central Africa, Tervuren©).

c. Collectors

Albert Alfons Maesen (1915-1991) was an important collector in the history of the museum. He had a PhD in Art history, and he did scientific research between 1953 and 1955 in Belgian-Kongo. During that time, he collected objects and he described every object in his field notebooks. Today, his field notebooks are an invaluable source of information about Congolese objects. During his scientific research, he collected 129 textiles that are now in the collection of the RMCA.

Gaston Fr. de Witte (1879 – 1980) was a Belgian herpetologist. He worked for the Royal Museum of Central Africa in Tervuren and for the Royal Belgian Institute of Natural Sciences in Brussels. He is the first one who systematically described the collected objects.

d. Understudied areas

To find out what is well-studied and what is understudied in the field of Central-African textiles, a survey of unpublished works such as fieldnotes and photographs is carried out. There is practically no attention for the material and the technical processes of the creation of textiles, except for weaving techniques. If any pictures were taken at all, of fibres preparation, cordage, spinning or the creation of pagnes, it is obvious that the photographer did not intend to provide information about the fabrication, as most of the photographs are taken far away or from an angle that does not show the gestures used to make the object. This in contrary to pottery, woodworking, basketry, weaving, and the fabrication of fishnets, which are all handcrafts that are gaining a lot more attention. Moreover,

the few of photographs that do exist are often of very poor quality due to the photographic techniques used during this period: collodion process, calotype and later the dry gelatin plate (Morimont 1998, 271) and probable difficulties of developing negatives. From the pictures almost no information about the processes could be obtained. Yet, there are some parallels in structure between basketry, the fabrication of fishnets and the dance costumes. For example, the structure of a part of the top of a Yaka costume shows similarities to the structure that is seen in the fishnets of the Dengese people. Pictures showing the production of fishnets, in the archive the different steps in the process is guided with a letter from Van den Broeck, Léon E. J. E. (1863-1921) where the practice is described.
Furthermore, in the notes of collectors and on the photographs taken in the 20th century there was practically no attention to the context of costumes. Which raises the question why there is so little to no attention and information about these objects. Was there really no interest in the costumes? Or since these costumes were used during rituals there were probably no outsiders allowed? Essential information to better understand and interpret these costumes is missing. Why are these costumes made? Who made them? Who wore them? Where they reused, how important were they? Were they considered treasures or purely functional objects?
Since this primary research raises so many questions about the costumes in the collection, the project focusses its attention on this part of the collection.
A selection of 46 textiles to be examined in depth was made. The aim was to choose a representative sample of the costumes. Costumes of different cultures and periods were chosen. This selection comprises complete costumes (masks, tops, pants, pagnes) but also incomplete costumes. The majority were worn during various traditional ceremonies. They are all made with cordage and looping techniques, but they show how versatile these techniques are. In addition high status capes worn by chiefs of the Kongo people were selected. They were added to the selection because the capes are created with the same basic technique as the dance costumes, namely looping, but it is a more sophisticated version with thinner cordage and different stiches. Underneath an overview is provides of the selected objects.

Table 1 : Initial selection of objects studied during the project

Catalogue number	Object description	Collector	Culture	Place and date of collection
EO.0.0.33776-3	Pants (Circumcision costume)	De Witte, Gaston	Chokwe	Katanga, 1931
EO.0.0.33776-4	Top (Circumcision costume)	De Witte, Gaston	Chokwe	Katanga, 1931
EO.0.0.27150	Top (worn during ritual ceremonies)	Jobaert, A. J.	Kete	Kasai, 1923
EO.0.0.2931	Top (worn by men, Atotchi parade costume)	Van den Broeck, Léon E. J. E.	Dengese	Cuvette, 1911
EO.0.0.30622-1	Pants	Burton, William	Luba	Katanga, 1928
EO.0.0.30622-2	Pants	Burton, William	Luba	Katanga, 1929

EO.0.0.32063-2	Pants (The dancer wearing the costume with the wooden mask is called “Hunga”, he is the circumciser or at least the leader of the circumcision)	Golenvaux, Pierre	Pende	Unknown, 1930
EO.0.0.32063-3	Top	Golenvaux, Pierre	Pende	Unknown, 1930
EO.0.0.32063-4	Pagne	Golenvaux, Pierre	Pende	Unknown, 1930
EO.0.0.33659-2	Pants (Karotash, circomsision costume)	De Witte, Gaston	Luba	Unknown, 1931
EO.0.0.33659-3	Top (Karotash, circomsision costume)	De Witte, Gaston	Luluwa	Unknown, 1931
EO.0.0.34073-2	Pants	De Witte, Gaston	Tabwa	Unknown, 1931
EO.0.0.39174	Top (Mukanda)	Bequaert ,Maurits	Yaka	Unknown, 1939
EO.0.0.41105	Cape (Chef)	Van Iseghem, André Charles Napoléon	Kongo	Unknown, 1945
EO.0.0.966-1	Costume (worn by women)	Dewatines, Gérard – Julien-Dominique	Songola	Ubundu, 1910
EO.1948.27.31-2	Costume		Yaka	Unknown, 1948
EO.1948.40.22-2	Pants		Pende	Unknown, 1948
EO.1948.40.22-3	Mask		Pende	Unknown, 1948
EO.1953.74.4151-10	Costume	Maesen, Albert	Pende	Zaïre, 1953
EO.1953.74.4151-2	Costume	Maesen, Albert	Pende	Zaïre, 1953
EO.1953.74.4151-4	Costume	Maesen, Albert	Pende	Zaïre, 1953
EO.1953.74.4151-5	Costume	Maesen, Albert	Pende	Zaïre, 1953
EO.1953.74.4151-7	Costume	Maesen, Albert	Pende	Zaïre, 1953
EO.1953.74.4151-8	Costume	Maesen, Albert	Pende	Zaïre, 1953
EO.1953.74.4151-9	Costume	Maesen, Albert	Pende	Zaïre,1953
EO.1953.74.4652-3	Costume	Maesen, Albert	Lwalwa	Zaïre, 1953
EO.1953.74.4808	Top	Maesen, Albert	Salampasu	Zaïre, 1953
EO.1953.74.4876-2	Top (initiation costume)	Maesen, Albert	Kongo (Dinga)	Boko, 1953
EO.1955.62.1	Costume	Olbrechts, Robert	A-Luena	Luena, 1955

EO.1962.10.113-1	Costume	Unkown	Yaka	Unknown, 1962
EO.1962.10.113-2	Costume	Unknown	Yaka	Unknown, 1963
EO.1999.12.3-1	Costume	Lukengo	Kuba (Bushoong)	Unknown, 1999
EO.1999.12.3-2	Costume	Lukengo	Kuba (Bushoong)	Unknown, 1999
EO.1999.12.3-3	Costume	Lukengo	Kuba (Bushoong)	Unknown, 1999
EO.1999.12.3-4	Costume	Lukengo	Kuba (Bushoong)	Unknown, 1999

3.1.2 PHOTOGRAPHIC RECORDS OF SELECTED OBJECTS

The objects are photographed with a black background, a colour chart and a ruler. The photographs are named as follows: Inventory number _JJMM_CONS_creator_01. The photographs are stored on the museum's server, which is regularly backed up.

Figure 17: EO.1953.74.4151-2_202202_CONS_ADP_01 (Courtesy of A. De Paepe, Collection of Royal Museum for Central Africa, Tervuren©).

3.1.3 COMPLETED RECORDS OF THE SELECTED OBJECTS IN THE TMS DATABASE

The completion of the records could not yet be fulfilled during the course of the project, but this process will continue after the project ends by our registrars and collections managers. The completion of information in TMS will be of great value to scholars, students, stakeholders, conservators both in house and outside the institute. This part of the project is very important and will definitely be continued. It will increases the visibility of the collection which will make it more accessible.

3.2 IDENTIFICATION OF PLANT FIBRES

The plant identification research was carried out in several phases: the first step was to compile a reference database since no reference database of Central-African fibres existed. A reference database is an essential tool to facilitate the identification of fibres found in the collection. The unknown fibres can be compared with the know reference samples in the database to compare key identification features. The Africamuseum holds a plant fibre collection of 120 specimen originating from Congo, the Meise Botanical Garden have an even larger collection. The fibres of the RMCA are described, inventoried, and photographs were taken. Then, these information was inserted in the existing database DaRWIN for valorising the collection. The origin of this collection was further investigated : who collected them? Why were they collected? To find answers, the acquisition files were consulted.

The fibres that were mostly used for the creation of the traditional textiles could be identified from this selection through consultation of published literature and archival documents. An informal collaboration was established with Liliane Tshikuta, a Congolese wood conservator from Institut des Musées Nationaux du Congo (IMNC) in Kinshasa. She gathered information on use and identification of plant fibres in the art market in Kinshasa.

A sample was taken of each fibre of the collection of the RMCA. The specimens of the Meise Botanical garden act as comparison material. To determine the textile fibres, different research methods were explored: macro observation, Polarised Light Microscopy (PLM), and Field Emission Scanning Electron Microscopy (FE-SEM). For the examination with PLM, cross-sections and macerations had to be made. Therefore a methodology had to developed and refined. The FE-SEM is conducted at Meise Botanical Garden by Iris van der Beeten.

The reference database has to be the main source for the determination of the materials in the textile collection, and other parts of the collection of the Africamuseum. Since plant fibres also appear many other kinds of objects e.g. masks, statues, musical instruments etc..

From every selected costume, samples were taken for determination and comparison with the reference database.

3.2.1 MATERIALS

Many plant fibres from the Africamuseum and Meise Botanical Garden were obtained in the botanical garden in Eala near Mbandaka (formely Coquilhatville), which was founded in 1900 by the Belgian Emile Laurent (1861-1904), botanist. The first director of the garden, agronomist Léon Auguste Edouard Joseph Pynaert (1876-1968), is one of the main collectors of the plant fibre collection of the Africamuseum. The main mission of the Botanical Garden of Eala was to study the region's flora and to try out the introduction of new plant and tree species to Africa, for commercial purposes. At the time, Eala was held to be the world's third most important tropical garden because of its biological diversity, surface area, and unique geographic location with respect to the equator.

In 1908, it published its first catalogue of plants and seeds offered for exchange or sale. It is a list of cultivated plants (± 820 species) in the garden of Eala where about 25 are designated as textile fibres.

Figure 18: Photo of the plant fibre collection of Central Africa of Meise Botanical Garden (Meise Botanical Garden ©)

Figure 19: Photo of the plant fibre collection of Royal Museum for Central Africa (Courtesy of A. De Paepe, Collection of Royal Museum for Central Africa, Tervuren©).

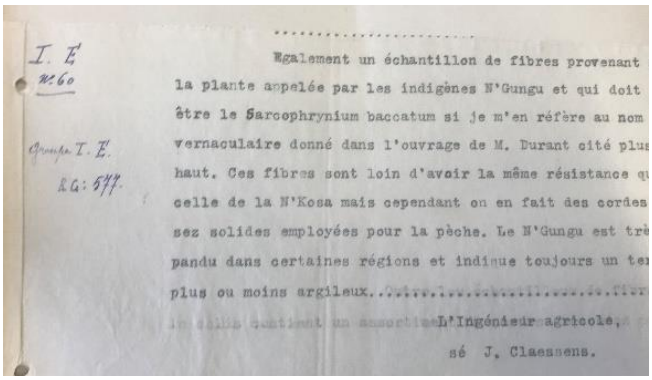
The plant fibre collection of the RMCA consists of 120 raw plant fibres collected during the 20th century. The oldest were collected in 1897, the newest in 1982. They were probably selected for their research proposes. The plant fibres are stored in a cabinet with hanging bundles, some are braided, and some are cords. 150 species from Meise Botanical garden were selected as comparison material, since there is no confirmation that the fibres were labelled accurately. The fibre bundles from the Africamuseum and Meise, all have old labels attached. On the labels of the Africamuseum, the date, name of species, region of collecting, and inventory number is written. The labels of the specimens from Meise report also interesting information such as vernacular names and locality. Even on the labels it becomes clear that plant fibres only were selected because of a possible economic value. The labels of the Africamuseum indicate that they belonged to the economic section of the institute. On the labels of the specimen of Meise the use of the fibre is described.

Because of the large quantity of samples, research was carried out to create an overview of the fibres that were used traditionally as textile fibres, this by archival research, literature research, and consulting wood conservator Liliane F. Tshikuta. The textile fibres that came out of this study were given precedence in the analysis.

Some acquisition files of the plant fibre collection gave more information about the use of a certain fibre, but this is regrettably rare. An example is found in acquisition file n° 59 containing a letter from General Deputy Director (for the Minister of Colonies) Arthur-Henri Baerts (1859-1940) to the Director of the Museum of the Belgian Congo concerning a consignment of Limbutu objects sent by agricultural engineer Jean Claessens (1873-1949), containing fibres, cords and a bracelet, with notes from Claessens attached with additional information.

The note shown in figure 20 says:

> “Also a sample of fibres from the plant called by the natives N'Gungu, which must be Sarcophrynium bacatum if I refer to the vernacular name given in M. Durant's book quoted above. These fibres are far from having the same strength as that of the N'Kosa, but nevertheless they are used to make fairly strong ropes for fishing. N'Gungu is very widespread in certain regions and always indicates a more or less clayey soil.”



I. E
n°60

Groupe I. E.
R.G: 577.

Également un échantillon de fibres provenant la plante appelée par les indigènes N'Gungu et qui doit être le Sarcophrynium baccatum si je m'en réfère au nom vernaculaire donné dans l'ouvrage de M. Durant cité plus haut. Ces fibres sont loin d'avoir la même résistance q celle de la N'Kosa mais cependant on en fait des cordes sez solides employées pour la pêche. Le N'Gungu est trè pandu dans certaines régions et indique toujours un te plus ou moins argileux.....

L'Ingénieur agricole,

sé J. Claessens.

Figure 20: Note from Claessens found in acquisition file nr. 59 (Collection of Royal Museum for Central Africa, Tervuren©)

Figure 21: The plant fibre descriped by Claessens, RG.577 *Sarcophrynium schweinfurthianum* (Kuntze) Milne-Redh (Courtesy of A. De Paepe, Collection of Royal Museum for Central Africa, Tervuren©).

Wood conservator Liliane Tshikuta conducted research in Kinshasa to find out what materials are mainly used for the creation of traditional costumes. She consulted the botanical garden of Kinshasa, but there she didn't find out very much information about the use of plant for the costumes. But fortunately she met a native there from the Kongo culture who worked previously on a plantation called Fernades company were textile fibres are extracted from the stems of *punga punga*. She also visited some art dealers on Limete, a commercial and and the wenze ya bokoko gallery in Pascal market, which sells plants for phytotherapy with products from Bznduhnu province. The wenze ya bokoko means a market where only traditional products are sold e.g. objects, herbal medicines, things related to spiritual and physical healing according to the ancestral tradition.
The table below shows an overview of the research carried out by Liliane Tshikuta, in Annex B, her complete survey is given.

Table 2: Overview research Liliane F. Tshikuta

Culture	Scientific name	Vernacular names	Plant fibre
Kuba	Arecaceae	Ibwon'	Piok
Luba and Lulua	Arecaceae	Dibondo and Dipande (two different palm trees, the one is taller than the other)	Mpeko
All Bankundu tribes from: Oshwe/Maindombe province	Arecaceae	Bapeke (Ipeke single) is taller than Lokali (small palm tree)	Ndele but Mpekwa is called for young fibers
Tiene (Batende) Village: Mpunyi/Yumbi/Mongama/ Mai-Ndombe province	Arecaceae (cotton tree?)	Mapiki Kutukungi	Nkia Kutukungi
Yaka Village: Kabama/ Popokabaka/Kwango province	Arecaceae	Mpusu	Mayimba (Yimba is single

Yaka village: Musamba/Kenge/Kwango province	Arecaceae ?	Mpusu Punga	Mayimba (Yimba is single) Kolokoso
Kongo village: Mbanza, Madimba, Ngugu/Kwilu province	Arecaceae	Mpusu	Makoko (koko single)
Kongo village: Yongo/Ngufu/Madima	?	Punga-Punga	Pungala
Yanzi village: Nkimputu/Bulungu/ndwe	Pueraria	Pung-Pung	Pung-Pung
Ekona Village: Nkuma/Bikoro/Itipo/ Mbandaka/Equateur province	Arecaceae	Bapeke (Ipeke single)	Belenge

As scientific name, only the family name Arecaceae (except for Pueraria Leguminosae) is given. It is not always clear which fibres these are, since the meaning of the local names is unknown, some local names do not occur in literature while other names are linked to different types of fibres.
An overview is given in the table underneath of the textile fibres. This is a summary of information found in literature, archives, and the labels of fibres of Meise. (Coquet 1993, 137 ; "Raphia Vinifera P.Beauv" n.d. ; "Hibiscus Sabdariffa" n.d. ; Palmenaer 2020, 95-105 ; Van Laere 1948) The plant fibres are divided into three groups depending of were from which part of the plant the fibre is obtained:

- Bast fibres: Fibres from the layer of vessel fibres in stems and under the bark in woody plants) bast e.g. hemp
- Seed fibres: Up or around the seed e.g. cotton
- Leaf fibres: The fibres are obtained from the leaves e.g. Agave, palm trees, banana plants

Table 3: Overview textile fibres

	Fibre	Vernacular names	Description	Usage
Leaf fibres	**Raphia sp.** *Raphia gentiliana De Wild*  *Raphia vinifera P. Beauv*	Tokolo, Mabondo, Ya Maie, Baheke	Native tropical African palms.(Raphia regalis has the largest leaves up to 20 m long and leaflets up to 180 cm). The upper side of the leaflets of the youngest, unfolded leaves is peeled off, dried and cut in small strips, which are strong and soft. The average	Baskets, mats, hats, bags, ropes, hammocks and ceremonial costumes, woven into cloth Fabrics are woven with single threads (for warp and weft) which define the size of the fabric Velours du Kasai

	 *Raphia sese De Wild*		length of the raffia fibre is 120 cm.	
	 *R. fanifera, R. Hookeri, R. regalis, R. taedigera*	Yéké		
	Musa sp. (Banana fibres) *Musa X paradisiaca L.*  *Musa textiles Née*		Edible bananas have been introduced in Central Africa since 15th C. Giant tropical herbs (±8m) have a (pseudo)stem formed by the leaf stalks which are harvested before flowering to provide long fibres.	From the trunks, they withdraw the fibres of which they make ropes: The outermost leaf sheets give stronger, darker and coarser fibre for cordage; the innermost leaf sheets are lighter-coloured, weaker
	 *Musa acuminata Colla* 	Abaca, Manila hemp	Musa textiles Née introduced from the Philippines around 1920 and has been tried out as fibre plant in Eala.	
	Sanseveria cylindrica Bojer ex Hookμ 	Bukong, snake plant	Succulent plants from dryer regions.	Fresh leaves are scraped (with a wooden tool) until only white fibers remain. Fibers are suited for bowstrings, rope, and sails.
Bast fibres	Clappertonia ficifolia (Wild.) Decne 	Punga za yanga, Ngwedi, Bokonge nsinga, Dokolenge (Bolo-Bolo in English)	Tropical African ornamental shrub (3m) growing in the wild in wet soils	Rope, hunting nets and woven cloths

	Urena Lobata L. 	Congo Jute Ikoba, Uakole	Tropical shrub (-2,5 m). The annual stems are harvested for the bark fiber, which is an important jute substitute.	Stems are defoliated and retted, the fiber is stripped, washed and dried. Congo jute is used for rope, fishing lines and nets, hunting nets and coarse textiles.
	Manniophyton fulvum Müll. Arg 	N'kosa, Losa, Mosamba, Lukosa	Tropical, African forest liana. The fiber is strong and resistant to rot.	Young stems are cut into pieces up to 2 m. Hairs are scratched. The bark is removed from the stem. Bark strips are sundried and pounded with a wooden mallet. The bark fiber is rolled and knotted to make hunting and fishing nets.
Seed fibres	**Gossypium sp.** *Gossypium barbadense* *Gossypium hirsutum* 		Species are originate in Central and South America and are naturalized in Congo since the 16th C. The shrubs (-2 m) are grown as annuals and need high temperatures, much sun and high humidity; the capsules need a dry period to ripen.	The longer seed hairs are spun to yarn which is woven into fabrics.

3.2.2 IDENTIFICATION METHODS

a. Macro observations

Macro observation the first step in the determination procedure to narrow down the possibilities. The key identification features being looked at are the colour, hardness, width and thickness of the fibres. Macroscopical photographs were taken as well as images with a magnification of 20 were made with the Dino-Light Edge Digital Microscope (AM4115T-FUW). These photographs with accompanying description are necessary for the identification of the textile fibres in the collection.

b. Polarized light microscopy

Furthermore the fibres are being analysed more in depth by using polarized light microscopy (PLM). Both cross-sections and macerations are made for the microscopical analyses of the plant fibres with the Olympus BX60 Fluorescence microscope. A maceration process involves a chemical treatment of the plant fibre with an acid to obtain an elemental fibre. The acid dissolves the middle lamella that

holds the cell/fibres together which causing them to disintegrate (Han, Mianowski, and Lin 1999). The maceration allows to measure the elemental fibre length, which is important for the identification of the fibres. Various maceration processes are described in literature, in this project Schulze's (1857) method is used. (Han, Mianowski, and Lin 1999) The Schulz's solution has been used successfully in the wood biology department of the institute for a long period of time.

Method for making macerations:

1. Put the plant fibres (about 1,5 cm) in a test tube and add 2-3 ml (or enough to cover the sample) of Schulz's solution:
   - Potassium chlorate ($KClO_3$): 24g
   - Distilled water: 200 ml
   - Fuming nitric acid (100%): 200ml

   (note: as fuming nitric acid is more expensive and more dangerous, it may be better to use 60% or 50% nitric acid and therefore adapt the dilution of the solution!)
2. For wood: Incubate (test tube heater) at 40°C to 60°C for 5 min. For most plant fibres is this not necessary and it increase the risk of solving the fibre.
3. When the maceration is finished, the plant fibres are translucent, and the fibres begin to detach from the sample. If the fibre is not as described above, continue the maceration, and observe every 5 min (or less) until you get the right result.
4. Wash 3 times with distilled water. To do this, pipette the liquid without removing the plant fibre (glass pipette) and then fill the test tube with distilled water (it may be useful to leave the samples overnight in the rinse water)
5. Place the sample in the staining solution (Safranin O & Alcian Blue) for 3 min (use small sieves).
6. Dehydrate the sample (5 min) in a succession of 50%, 75%, 96% and 100% alcohol solutions.
7. Place a small amount of plant fibre fragment on a slide and gently pull the pieces apart with a tweezers. It may be helpful to add a little 100% alcohol to the slide.
8. Add a few drops of Euparal, carefully place the slide, and allow the preparation to dry.

Cross-sections are made to show the cells, cell walls and lumen, which is essential for determination. To make cross sections, the samples are first imbedded in Polyethyleen glycol (PEG) 5000, for this purpose a silicone ice cube tray is used. The samples are laid at the bottom in vertical or horizontal direction in the little boxes and covered with melted (50°C-70°C) PEG 5000, the samples need to be completely covered. The tray is placed overnight in an oven (50-70°C) so that the PEG can impregnate the fibre. After one night, the tray is placed in a refrigerator to coagulate
the PEG 5000 for approximately 30 minutes. When the cubes have solidified remove the blocks from the tray and cut the edges even with a blade. Then place the block on the semi-automatic microtome, for plant fibres slices of 20 µm – 25 µm are made with tape. The fibre will be stuck to the tape and the PEG will dissolve in water. The samples are stained with a solution Safranin O and Alcian Blue for 5 min and then dehydrated in a succession of 50%, 75%, 96% and 100% alcohol solutions. The samples are embedded with Euparal on a glass slide.

c. Field-Emission Scanning Electron Microscope (FE-SEM)

The specimens are scanned with the Field Emission Scanning Electron Microscope (FE-SEM) at the Botanical Garden of Meise. The samples are mounted on aluminium stubs using carbon adhesive tape and coated with a platinum palladium mix with a Cresssington JFC-2300/208HR sputter coater. FE-SEM images are obtained with a JEOL JSM7100 Field emission scanning electron microscope. The coating permits to enable and improve the imaging of the samples. The thin layer of metal is conductive which inhibits charging, reduces thermal damage, and improves the secondary electron signal. In the past, gold was used (is less expensive), but with the new FE-SEM (formerly an ordinary SEM) of the Meise Botanical Garden, larger magnifications can be used which causes the coating become visible sometimes at very large magnifications. The platinum palladium mix is much finer than gold so it is less visible. The surface morphology of the elemental fibre become visible with the FE-SEM.

3.2.3 RESULTS

As an example and to evaluate the different research method, three samples of different Raphia species are shown.

Table 4: Sample given as example

Sample	Inv.no.	Name species	Date and place collecting
RMCA_002	RG.541	*Raphia Gentiliana* De Wild.	Eala, 1910
RMCA_060	RG.1278	*Raphia Sese* De Wild.	Lusambo, 1912
RMCA_001	RG.543	*Raphia Vinifera* P.Beauv.	Eala, 1910

The first level of observation allows to give a first clue of which material it can be. Visual observation is neither time-consuming nor an expensive method and can be done by everyone. This observation goes hand in hand with literature research, a geographical study, and correspondence with natives. However, this this kind of research cannot be conclusive. To be certain, the material needs to be studied more thoroughly.

The preparations of the fibres, especially the maceration process, is very time consuming, and the prepared samples of the macerated fibres were not always usable. During the maceration process the fibres were in 20% of the cases completely dissolved by the acid. Very often, in seven of the ten preparations, the elemental fibres were not complete so the entire length of the fibres could not be measured (fig.22). Of the Raphia Sese a good maceration image is made which shows a curled fibres as described in literature (fig.23). (Lautenschläger et al. 2019) To have a representative result, a large amount of fibres needs to be analysed (± 50). This invasive sampling, poses a problem when sampling textile artefacts since sampling should be as minimally invasive as possible. (Smith et al. 2017) The preparation of the cross-sections was easier and faster. It did require experimentation with the thickness of the slices (between 30µm-17µm), depending on the fibre.

The Field Emission Scanning Electron Microscope works relative quickly, five to ten samples can be prepped and observed in one day. The only disadvantage of this method are the costs. A good FE-SEM is quite expensive and not every institution has the ability to use this method. When having the images

of the PLM and the FE-SEM, comparative material is rarely available, since a lot of fibres are not commercially exploited which makes the determination difficult (Carr et al. 2008).

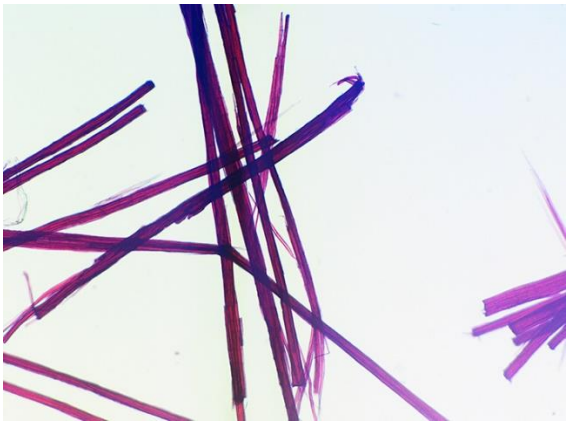


Figure 22: Maceration of Abutilon Angulatum (guill.& Pess.) Mast, 4X RG.4448, (Courtesy of A. De Paepe, Collection of Royal Museum for Central Africa, Tervuren©).

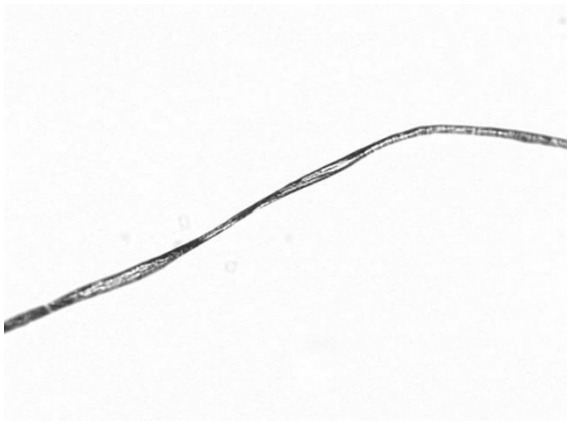


Figure 23: Maceration of Raphia Sese, 10X RG.1278, (Courtesy of A. De Paepe, Collection of Royal Museum for Central Africa, Tervuren©).

The xylem seen on the cross-section of the Raphia Sese consists out of two wide metaxylems. This phenomenon is described in an article of M. Pyykkö about the identification of *Raphia hookeria* stating that *Raphia Hookeria* most of the time has two metaxylems, rarely one vessel. (Pyykko 1985) However T. Lautenschläger which discussed the *Raphia Matombe* fibre through the cross-section with only one metaxylem. (Lautenschläger et al. 2019) Since there are only a few articles written about the determination of Raphia fibres it is unclear if the sample in this project is *Raphia Hookeria* instead of *Raphia Sese*, or have the fibres of *Raphia Sese* also two metaxylem or is it a coincidence that the example in the article of *Raphia Matombe* has only one vessel. It appears that on the cross-sections of the *Raphia Gentiliana* De Wild. and the *Raphia vinifera* P.Beauv. only the outer layers are present.
The FE-SEM images a part of the cross-section of the *Raphia Vinifera* P. Beauv (Sample RMCA_001) shows some vision on the cross-section of the fibre. On the images the honeycomb-like pattern becomes visible, as described in the reference literature. (Elenga et al. 2009) Only one diameter of the alveoli could be measured, 7µm, references mention diameters of 6-13% diameter. (Elenga et al. 2009) The alveoli's are also visible by one samples of the *Raphia Gentilliana* De Wild.(RMCA_002) but they could not be measured since there was no image with the right angle of the fibre. The FE-SEM images only capture the surface of the fibres. FE-SEM images of cross-sections will be much more useful.
R.G. Elenga *Effects of Alkali Treatment on the Microstructure, Composition, and Properties of the Raphia textilis fiber* analyses SEM images of the surface of the *Raphia Textilis* fibre and are similar to the SEM images of the Raphia fibres in this project. (Elenga et al. 2009)

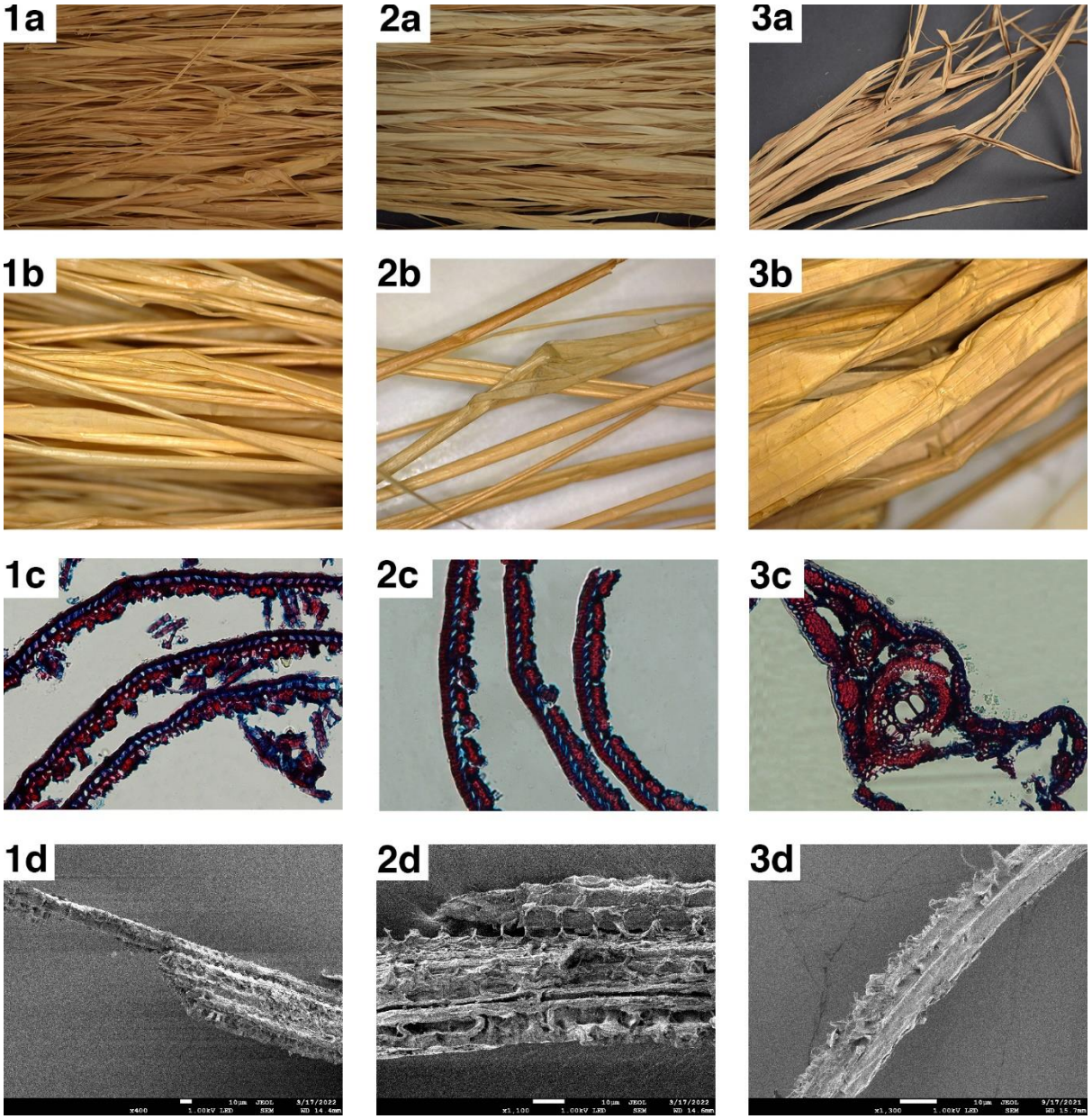


Figure 24: Figure 25: fig. 1a-d: Raphia Gentiliana De Wild., fig. 2a-d: Raphia Vinifera P.Beauv., fig. 3a-d: Raphia Sese ; fig. 1-3a: Macro photographs with NIKON D810 with f/16, fig. 1-3b: Dino-Light Edge Digital Microscope (AM4115T-FUW) 20X, fig. 1-3c: Cross-sections Olympus BX60 Fluorescence microscope, 200X; fig; 1-3d: FE-SEM JSM7100F FE-SEM 1=400X 2=1100X 3=1300X (Courtesy of A. De Paepe, Collection of Royal Museum for Central Africa, Tervuren©).

3.2.4 CONCLUSIONS

All the 120 plant fibres are photographed, and images were taken with the Dino-Light Edge Digital Microscope. SEM images are taken from all the fibres, 40 cross sections are made and 48 macerations. Different methods are needed for the identification, but it depends on the fibres which methods are most useful. Identification with macerations is difficult, but cross-sections and the FE-SEM images give a lot more of information. The current technique for making macerations is not suitable for fragile fibres and will need further refinement.

Other analytical methods for the identification of plant fibre materials should be explored to develop a more efficient method for the identification of the materials. Determining the plant fibres is more difficult than previously thought. It does not compare with the identification of the common materials

used in the Low Countries throughout history, such as cotton, linen, and animal fibres like silk, wool and hair.

In the field of botanical anatomy, different parts of the plant are required for the determination process (Carr et al. 2008). Textiles are usually made with the fibre of only one part of the plant. As a result, microscopical identification is much harder. Furthermore, DNA analysis is predominantly used for the determination of the different plant parts by botanists. However, since the textile collection, and the plant fibre collection contains old fibres, the DNA material is too degraded for analysis. The textile fibres are mostly processed prior to the fabrication of traditional costumes. The physical and chemical structure can be altered during preparation processes. The preparation can cause the removing of important key identification features. There is also the possibility that there are differences noticeable in structure of the plant fibre due to the variable conditions in the growing and harvesting of the plant (Carr et al. 2008).

An additional problem is that there are not many reference works to compare microscopic images of the fibres with. Other methods that can be explored in the future are er Fourier Transform Infrared (FTIR) and Micro-computed tomography.

Of every selected object, samples were taken of the different fibres. When another analysis method proves to give adequate results, the material of the selected textile can be analysed without taking them back out of the storage.

Although attempt to identify materials were not very successful, other good things did come out. For the first time, the entire plant fibre collection of the Africamuseum is photographed and inventoried and the data is implanted into the database DaRWIN (is explained in 4.2.3). Hopefully, the photographs can be linked to the records soon. From this database, new labels can be printed with all the essential information that can be attached to the fibre bundles, since the old labels are in a very bad shape, from some bundles the labels already fallen off which is problematic for future reference. Also in Meise Botanical Garden, this project was the driving factor to start with photographing and inventorying their collection. This part of the research has strengthened the bands between the two institutions and may accelerate future collaborations. During the project, it came to light that Meise also has an interesting reference collection of natural dyes which could be used for a follow-up project into natural dyes used for textile colouring.

3.3 IDENTIFICATION OF THE TECHNICAL PROCESS FOR CREATING TEXTILES

Literature research was conducted about the structures and techniques of the textiles from the Democratic Republic of Congo. It is noticeable that a lot of research is written about the Kuba textiles while other cultures are left behind. Literature was found on weaving techniques, mostly plain weaving is used, with added embroidery including the velvet structure. Furthermore, information on the different looms can be found.

Together with Frieda Sorber, textile specialist and former curator of the fashion museum in Antwerp, a selection of objects based on their materials and manufacturing techniques was analysed. From the extensive collection of mask costumes, 45 partial or complete costumes were analysed structurally. The techniques were examined using visual inspection, which is just a thorough observation of every thread until it's clear how they are interact. For a completely understanding on how the techniques work, their complexity, and to discover labour intensive the creation of textiles is, recreation of the structures was necessary.

Detailed pictures and technical drawings are made of the techniques. These images will help other conservators and all people interested in the textiles identify techniques. For adding the right techniques to the object records in TMS, new terms had to be added into the database of the museum.

3.3.1 FABRICATION OF FIBRES

About the fabrication of textile fibres, the written resources are rare. In the archives, attached to a letter from 1 March 1912 concerning shipment no. 1285, is a written report by agronomist Dobbelaere (nd.). This report gives information about the fabrication of fibres from the *Raphia sese* De Wild., Triumfetta sp, and *Manniophyton fulvum* Müll. Arg. Akonge is the product of the bark of the plant *Triumfetta* sp. The stem is split in the middle, the bark is removed from the wood and then dried in the sun. The fibres from N'Kosa, is the vernacular name of *Manniophyton fulvum* Müll. Arg, undergo the same preparation as banana fibres (*Musa* sp.). The plant is cut when it has reached a height of 1,50 to 2 m, the core is being removed and cut into strips. These strips are scraped with a knife until all aqueous matter is gone; the fibre thus acquires a whitish colour and is dried in the sun. For the preparation of *Raphia sese* De Wild for weaving textiles, the fibre is extracted from the raffia leaf with a small knife by detaching the leaflets from the leaf. This fibre is then dried without further preparation. In one publication from 1981 a brief description is found about the preparation of Raphia fibre: The upper side of the leaflets of the youngest, unfolded leaves is peeled off, dried and cut in small strips, which are strong and soft. The average length of the raffia fibre is 120 cm. (Vandeput 1981) The type of Raphia isn't mentioned in this publication. It is unclear if the type of Raphia makes an difference in the fabrication process of the textile fibre. To make the naturally rough and stiff fibers softer two methods were found into the literature. The first method is to comb and scrape the fibers with the sharp edge of a snail's shell, the second method is the soak the fibers into water and wrapping them in old rags and putting them into a wooden mortar to crush the fibers. (Coquet 1993, Gillet, Gillet, and Paque, 1910)

Figure 26: Fabrication of Raphia fibres, EP.0.0.14041, (1936) (Courtesy of H. Rosy, Collection of Royal Museum for Central Africa, Tervuren©)

Liliane Tshikuta found out that the stems of the *punga punga*, most likely *Urena Lobata* L., are cut and the leaves stripped off, afterwards they are soaked in a container filled with water for three days to two weeks (the number of days depends on the expected results) to get rid of the barks. The stems need to be rubbed with the hands to be sure that the bark is completely removed and then the stems are removed from the water. These stems are the obtained fibers which are dried in the sun. Finally, they are starting making the traditional costumes. The fibers are white, but they can be colored.

3.3.2 BASIC STRUCTURE TECHNIQUES COSTUMES

a. Cordage

The agronomist Dobbelaere (n.d.) gives also a brief description in his report on how the fibres are processed into cords: “To make cord, the fibres are rolled between the hands and twisted on the thigh.” This technique, of making cordage on the thigh, can be seen on a photo taken in 1949 (EP.0.0.3972), shown in figure 27. All the costumes, excepted the pagnes, that are analysed are made with cordage. In the collection different diameters can be found from very thick to very fine cordage. The cordage can be double or triple, made from two or three elements twisted in S- or Z – direction. Typical for cordage is that short lengths can easily be made, a necessity for looping techniques. Looping is only possible with relatively short lengths of thread that need to be joined (visibly or invisibly). The joining can be done as the looping progresses.

Figure 27: Girl who is making cordage on the thigh, Tutsi, Acquisitioned in 1949 EP.0.0.3972 (Courtesy of P. Cogniaux, Collection of Royal Museum for Central Africa, Tervuren©)

Figure 28: Detail picture of cordage

Figure 29: Example of an Z-twisted cord, EO.0.0.32063-1 (Courtesy of F. Sorber, Collection of Royal Museum for Central Africa, Tervuren©)

Figure 30: Example of an S-twisted cord, EO.0.0.30628 (Courtesy of F. Sorber, Collection of Royal Museum for Central Africa, Tervuren©)

For the vast majority of analysed costumes, a starting cord is used on which one continued to work with the looping technique, 6 analysed objects did not have a starting cord. This starting cord can be cordage (9), braids (12) or even a thick fibre, folded or otherwise (3). The cordage as starting cord is found in 7 cultures: Chokwe, Kete, Luba, Pende (pagnes), Luluwa, Songola, Salampasu.

Figure 31: Example of a top with cordage as starting cord, Chokwe, Collected in 1931, EO.0.0.33780-2 (Courtesy of A. De Paepe, Collection of Royal Museum for Central Africa, Tervuren©)

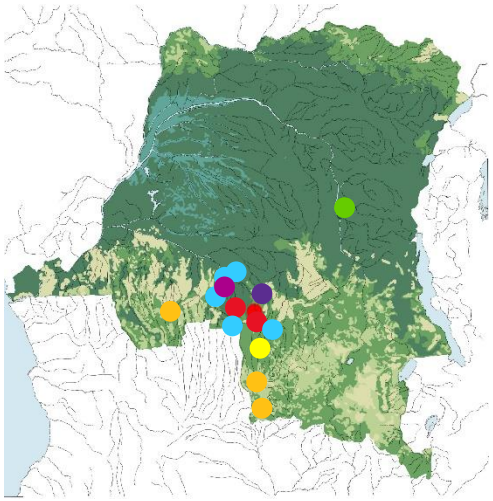


Figure 32: Map of Chokwe, Kete, Luba, Pende (pagnes), Luluwa, Songola, Salampasu (using starting cords)

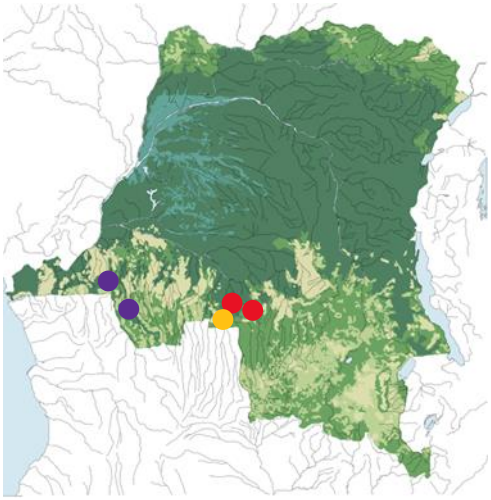


Figure 33: Map of Yaka, Pende, and Kongo-Dinga (using braids)

b. Braiding

In twelve of the observed costumes a starting braid is used to anchor the first row of the looping. These braids can be made with 3, 4 or even 5 strands, the thickness varied from 0,6 cm – 1,3 cm. These braids are found in all the analysed Yaka and Pende costumes, and also in the only one Kongo-Dinga costume. In the Yaka costumes as well as 3 and 4 strand braids are found, the braid in the Pende costumes are all made with 3 strands. The braid in the Kongo-Dinga costumes counts 5 strands.

Figure 34: Example of a 3 stranded braid, EO.1953.74.4151-1, Pende, Acquisitioned in 1953, (Courtesy of A. De Paepe, Collection of Royal Museum for Central Africa, Tervuren©)

Figure 35: Example of a 4 stranded braid, Yaka, Acquisitioned in 1939, EO.0.0.39174 (Courtesy of A. De Paepe, Collection of Royal Museum for Central Africa, Tervuren©)

Figure 36: Example of a 5 stranded braid, Kongo-Dinga, Acquisitioned in 1953, EO.1953.74.4876-2 (Courtesy of A. De Paepe, Collection of Royal Museum for Central Africa, Tervuren©)

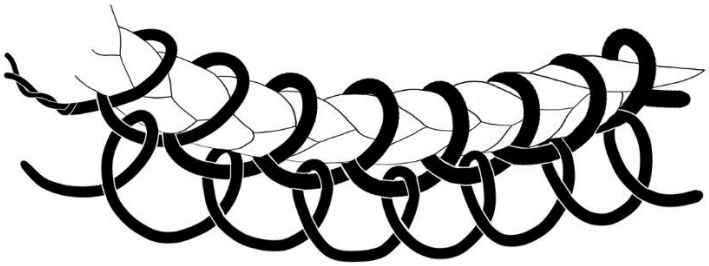


Figure 37: Technical drawing of a starting braid, and looping

c. Looping

The majority of the analysed objects are constructed with the looping techniques. These loops are fabricated using threads or cords that have been made with cordage making techniques. In the archive, fieldnote books of Albert Maesen, and in published literature almost no information about these technique could be found. Also photographs of making the costumes are rare. Two photographs are found which showing the method of making leggings among the Eastern Luba (DRC) and Mbwela (Angola) in the 1960s-1970s. These photographs shows us that a needle is used for making loops. It can also be seen from the pictures that they look for a tree trunk with about the same diameter as a leg to be used as a mould.

Figure 38: Probably Kabalo area (eastern luba cultural zone), Men is making leggings for a mask costumes of the luba *kifwebe* society (courtesy of N. Seeuws (1972) Archives J. Volper©)

In a publication a drawing was found of something that looks as a bow, which is named *Livalo*. Around this bow a cord or braid is wrapped on which they make looping's.

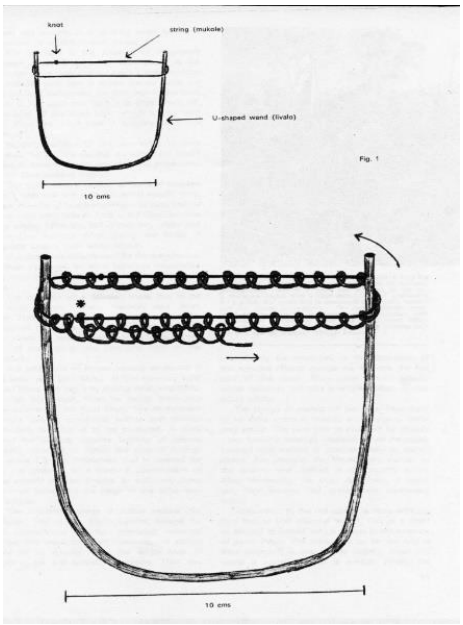


Figure 39: KUBIK, G., 1969, Masks of the Mbwela, in Geographica (Lisboa), N°20, pp.3-20

S- & Z-direction

Just like cordage looping can be done in a Z-and S direction.

Figure 40: S- looping

Figure 41: Z-looping

Single looping and double looping

In one piece different directions can be found both directions are sometimes used. The S-and Z-direction can alternate, one in S- and one in Z- direction. These loops are firmer than when all the looped stiches are in one direction, the loops are securing each other. The majority of the costumes, 13, with exception of the capes and pagnes are made with looping in the same direction. Alternate loops are found by the Salampasu, Kete and Yaka.

Figure 42: Single looping

Figure 43: Alternating loopings

Figure 44: A top of Salampasu with s-and Z-direction loops, Acquisitioned in 1950, EO.1950.14.13, (Courtesy of F. Sorber, Collection of Royal Museum for Central Africa, Tervuren©)

Figure 45: A top of Salampasu with s-and Z-direction loops, EO.1950.14.13, (Courtesy of F. Sorber, Collection of Royal Museum for Central Africa, Tervuren©)

The Yaka costume below shows different looping structures. The object is a long sleeved top collected by Mauritits Bequaert[4] (1892-1973) in 1939. The main looping structure is a in a s-direction, but at the bottom first a row of alternate S- and Z looping. The bottom is an open-worked and shows similarities with the techniques that are also used for making fishnets. This technique is in-dept descripted by Van den Broeck, Léon E.J.E. (1863-1921) in a letter from 1 June 1910 and is illustrated by step-by-step photographs.

Figure 46: EO.0.0.39174 (Courtesy of A. De Paepe, Collection of Royal Museum for Central Africa, Tervuren©)

Figure 47: Detail of the main looping structure, EO.0.0.39174 (Courtesy of A. De Paepe, Collection of Royal Museum for Central Africa, Tervuren©)

[4] Maurits Bequart was a conservator of the department prehistory and Anthropology for the museum of Belgian Congo.

Figure 48: Detail picture of the bottom of the top were double looping is used, EO.0.0.39174 (Courtesy of A. De Paepe, Collection of Royal Museum for Central Africa, Tervuren©)

Figure 49: Detail picture of the top of the object were a similar technique as a fishnet was used., EO.0.0.39174 (Courtesy of A. De Paepe, Collection of Royal Museum for Central Africa, Tervuren©)

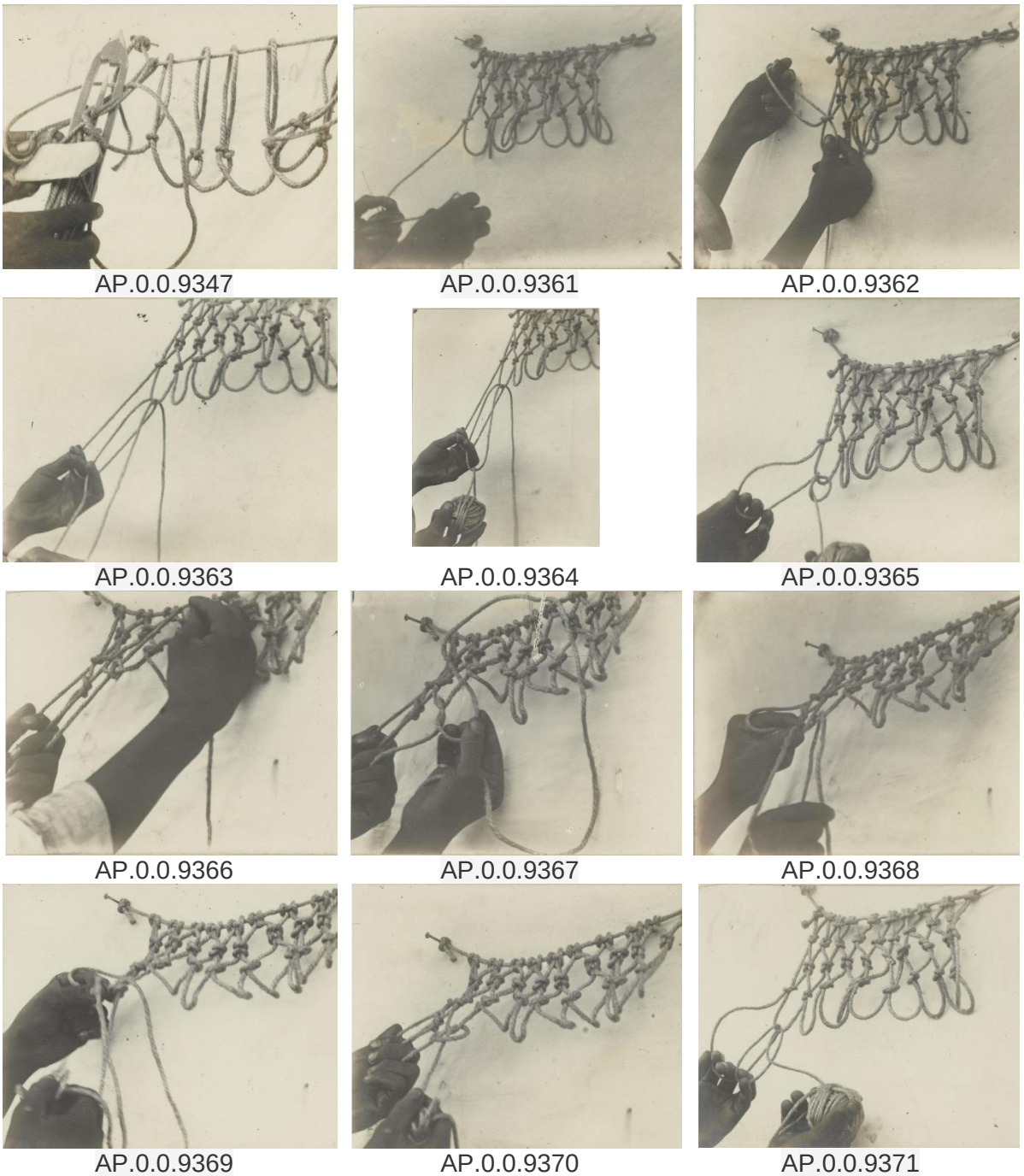


Figure 50: Step-by step photographs of making a net. Photographs taken in 1919 (Courtesy of L. Van den Broeck, Collection of Royal Museum for Central Africa, Tervuren©)

d. Designs

Horizontal lines, triangles, ovals, diamonds

A sophisticated costume of the Chokwe from 1931 collected par Gaston Fr. De Witte, 1979-1980 shows an interesting manner too form designs into costumes made with the looping technique. The object illustrated is a long sleeved top with a rounded neckline and sewn on gloves. The front of the body has big triangle designs, with smaller triangles on top; the back has a similar main design, but two ovals between the bridge cords connecting the sleeves. To make these designs, cords are used as a scaffold used to build looping stiches on both sides of the cord, the triangles are made from the outside to the inside. This way of working seems very simple, but it is not. With this, there are still some questions to be answered, like how were these scaffold cords stretched prior to filling in with looping stiches? Does this design have any special meaning or does it have just an aesthetic value? Boris Wastiau described the mask that came along with the costume in 2008 The mask is called *Kalelwa* and is worn by skilled dancers at various stages of the initiation of young boys (*mukanda*). It represents one of the ancestors who sponsors the novices who are taught to prepare them for adult life during their reclusion in a bush camp. Only the initiated know the secrets of the masks. The mask also contains textiles made with the looping technique.

Figure 51: *Kalelwa* mask EO.0.0.33776-1 (Courtesy of Studio R. Asselberghs - F. Dehaen, CC-BY 4.0, Collection of Royal Museum for Central Africa, Tervuren©)

Figure 52: The front and the back of the Chowke costume, the red lines are the cords, EO.0.0.33776-4 (Courtesy of A. De Paepe, Collection of Royal Museum for Central Africa, Tervuren©)

Figure 53: Figure 41: Detail of a triangle and the cords, EO.0.0.33776-4 (Courtesy of A. De Paepe, Collection of Royal Museum for Central Africa, Tervuren©)

The use of cords to make a sort of frame is also found by a costume of Lwena (EO.1955.62.1), who are related to the Chokwe. The costume was collected by Robert Olbrecht[5] (n.d.) in 1955. The front and the back of the top consist each a rectangular panel with at the front a design of 4 triangles.

Figure 54: Front side of the costume, EO.1955.62.1 (Courtesy of A. De Paepe, Collection of Royal Museum for Central Africa, Tervuren©)

Figure 55: Detail picture of the frame cords, EO.1955.62.1 (Courtesy of A. De Paepe, Collection of Royal Museum for Central Africa, Tervuren©)

[5] Deputy Territorial Administrator in Dilolo (1954)

Figure 56: The inside of the costume, EO.1955.62.1 (Courtesy of A. De Paepe, Collection of Royal Museum for Central Africa, Tervuren©)

To add a striped pattern in the costumes, looping stiches in different colours were used. An example is shown below, a costume of the Luba Bena-Mitumba which belonging to a *katotoshi* mask that is used by the *mukanda* ceremonies. The costume was collected in 1931 by Gaston Fr. De Witte. Black and purple stripes are painted as well on the top as the leggings.

Figure 57: Painted stripes, EO.0.0.33659-2-3 (Courtesy of A. De Paepe, Collection of Royal Museum for Central Africa, Tervuren©)

Openwork designs (capes)

The collection of the Africamuseum contains, as far as known, nine capes are collected between 1921 and 1997. These type of cape are worn by the Chiefs of Kongo people, who live at the coast of the Atlantic ocean in Central Africa. The capes are very sophisticated, they are made with a double looping technique and are created with very fine cordage.

In the photograph below along side the chef Paul Kimpakala (nd.) is pictured with a cape described in this report. In the file that belongs to this photograph more information is given about the local names: "Pélerine = *kampa* (*kingembe*). Sabre = *mbele a lulenda*. Etoffe = *muwala*. Cloches = *ngongi*.". This photographs was taken by Albert Maesen, he also collected a cape and wrote down the vernalular names in his fieldnotes. In his fieldnotes, also a decription is found of a cape, this fieldnote is dated on 8 August 1953, the same month that the photograph was taken. Probably, the cape illustrated and described cape was the one from the photograph. In this note he descriped the cape as a shoulder cloak knitted in raphia. This clearly shows that Albert Maesen was not familiar with textile techniques. The vernacular name of the tassel is descripted as *kólo*.

Figure 58: EO.1953.74.671 (Courtesy of A. De Paepe, Collection of Royal Museum for Central Africa, Tervuren©)

Figure 59: Field notebook Albert Maesen no.1 p46, Collection of Royal Museum for Central Africa, Tervuren.(Collection of Royal Museum for Central Africa, Tervuren©)

Figure 60: Le chef Paul Kimpakala du clan Mankunku, au village de Soyo (région de Matadi), HP.1956.56.149 (Courtesy of A. Maesen (1953), Collection of Royal Museum for Central Africa, Tervuren©)

The cape below is acquisitioned by the museum in 1945, it was collected in DRC by André Charles Napoleon Van Iseghem (1865-1944)[6].

Figure 61: EO.0.0.41105 (Courtesy of A. De Paepe, Collection of Royal Museum for Central Africa, Tervuren©)

Figure 62: EO.0.0.41105 (Courtesy of A. De Paepe, Collection of Royal Museum for Central Africa, Tervuren©)

3.3.3 SURFACE DECORATIONS

In one costume of Kongo-Dinga, collected by Albert Maesen in 1953, knots are used as decoration. Over each left element of a looping stitch is an overhand knot made with plant fibre. Both ends of the knots are cut off and have frayed, which gives the costumes a soft that make the costume look soft, almost cuddly. This technique is also seen by the Lwalwa en Kete[7].

Figure 63: Costume of Luluwa, EO.1953.74.4876-2 (Courtesy of A. De Paepe, Collection of Royal Museum for Central Africa, Tervuren©)

Figure 64: Detail of the knots, EO.1953.74.4876-2 (Courtesy of A. De Paepe, Collection of Royal Museum for Central Africa, Tervuren©)

[6] A. Van Iseghem had a doctorate in law obtained at the University of Ghent. His first time in DRC was in June 1896 as a secretary of Albert Thys. He was active in colonial circles in Belgium and a member of the action committee for African National Implementation. He is also editor of the Belgian Congo newspaper. He also served as district commissioner in Belgian Congo.

[7] The costume of Kete (EO.0.0.32538-2), was not in the selection but is currently in the permanent exhibition of the Africamuseum.

Figure 65: Costume of Kete, with knots at decoration technique, EO.0.0.32538-2 (Courtesy of A. De Paepe, Collection of Royal Museum for Central Africa, Tervuren©)

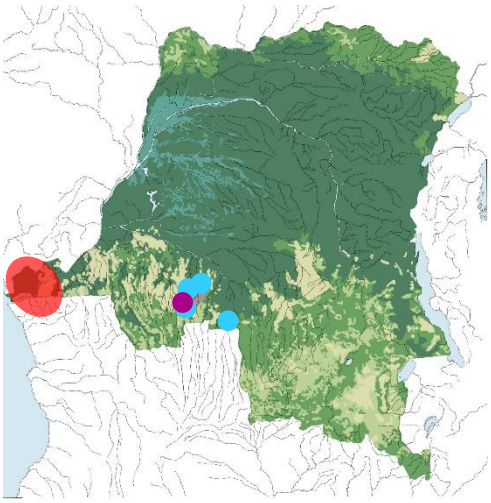


Figure 66: Map of, Kete, Luluwa, Kongo-Dinga

3.3.4 EMBROIDERY

The top below is from the Kete culture, it was collected in 1923 by A.J. Jobaert (nd.)[8]. The stem stitch, an embroidery technique, is used on the basic looping structure to make a zigzag pattern. The top is probably stored inside-out, since the stich shows to best advantage on the inside of the object. On figure 68 a detail is shown of a Salampasu costume[9], were these same technique is used, only the pattern is different. This Salampasu costume wasn't added to the original selection, but is cited here because of the similarity in structure. The same technique was also seen in a Pende costume (EO.0.0.32063-3).

Figure 67: EO.0.0.27150 (Courtesy of J.-M. Vandyck, CC-BY 4.0, Collection of Royal Museum for Central Africa, Tervuren©)

Figure 68: Another top that is decorated with the stem stitch, EO.1950.14.13 (Courtesy of F. Sorber, Collection of Royal Museum for Central Africa, Tervuren©)

[8] Lieutenant Honoraire de Chasse à Luisa (Kasai)

3.3.5 CONCLUSIONS

During the project an in-dept analysis of 45 partial or full costumes was performed. In total more than 100 objects were looked at to compare with the initial selection. The costumes are all close-fitting and cover the entire body. They include long-sleeved tops, gloves, trousers or stockings and foot coverings. Some types also include a head covering, a mask, but most were worn with carved wooden masks. Some costumes have separate skirts with frills and collars. Even though the dance costumes all looked very similar at first side, there are some differences noticeable.

The main structure of almost all costumes consists of looping worked with relatively short lengths of cordage. The processing method, which is the same for all the objects examined, allows the garments to be shaped as they are made, and makes possible designs consisting of stripes, checks and ovals. Through the examination of the structures little differences could be noticed between the cultures. For example the Chokwe costumes are very sophisticated costumes with different designs made using scaffolds cords. But most of the structures occur in different areas, also not much differences is noticed in costumes over time.

3.4 OPTIMISATION CONSERVATION AND PRESERVATION PROTOCOL

The ethnographic textile collection counts 4961 objects of different sizes and types from garments to mats. At the moment these textiles are stored in cabinets that do not comply to museum standards for storing textiles. Most of the textiles doesn't packed appropriately and are not supported as they should be. There are too many textiles stacked on each other making the collection inaccessible. Especially the textiles stored in the drawers pose a problem. These drawers are very heavy to lift (you need to be with two persons), and are jam-packed.

An inappropriate storage of the collection causes a faster deterioration process of the collection. The damages that can be observed are: material loss (shedding fibers), folding lines, deformation, discolorations, tears, gaps.

Figure 69: Cabinet in the storage RMCA ©

Figure 70: Textiles stored on tubes RMCA ©

Figure 71: Inside the cabinets in storage RMCA ©

Figure 72: Drawer inside the storage area RMCA ©

3.4.1 SURVEY

A survey of the textile collection was conducted on 36,57% of the textile collection to map the condition of the collection and to gain insight into the points for improvement. This includes how many of the objects show a certain type of damage, which type of damage is typical for which type of object or material, what the possible causes of this type of damage are, etc. The knowledge gained from the analyses serves as basis for a proposal for proper care and long-term storage of the textile artefacts. This findings can be incorporated in to the optimization of the storage, reorganization and rehousing of the textile collection in the future.

Amount of objects	Textile category	Storage medium	Light	Wrapped	Stacked	Supported	Folded	Damages
26	(parts) costumes	Boxes			Y			Gaps Material loss Tears
1	3D	Box						Material loss
11	3D	Cabinet						Material loss
7	Masks	Cabinets				Y		Gaps Material loss
1	Plant fibre bundle	Cabinets		Y				Material loss
4	Plant fibre bundles	Cabinets		Y			Y	Material loss
23	(parts) costumes	Cabinets						Material loss Tears
2	(parts) costumes	Cabinets					Y	Folding lines Material loss
12	(parts) costumes	Cabinets			Y		Y	Folding lines Material loss
1	(parts) costumes	Cabinets		Y				Material loss
2	(parts) costumes	Cabinets		Y	Y		Y	Material loss
920	Flat textiles	Cabinets						Discolorations Folding lines Gaps Material loss Tears
32	Flat textiles	Cabinets					Y	Discolorations Folding lines Material loss
1	Flat textiles	Cabinets				Y		None
267	Flat textiles	Cabinets			Y			Folding lines Material loss
428	Flat textiles	Cabinets			Y		Y	Folding lines Material loss tears
4	Flat textiles	Cabinets			Y	Y	Y	Tears
33	Flat textiles	Cabinets		Y				Discoloration Material loss
2	Flat textiles	Cabinets		Y			Y	Folding lines
8	Flat textiles	Roll						Material loss Folding lines
3	Flat textiles	Roll			Y	Y		Material loss
19	Flat textiles	Roll		Y				Material loss
7	Flat textiles	Roll		Y		Y		Material loss
3	Flat textiles	Roll		Y	Y	Y		Folding lines

The outcome of the survey makes it clear that material loss appears the most occurring damage. This was to be expected and is no surprise since plant material is a very sensitive material to easily due to manipulation, fluctuations in relative humidity, light and insufficient support. A good side is that though discolorations occurs, most of the textiles are stored in dark.

The occurring damages on the **flat textiles**, besides material loss, are mainly, folding lines, tears, discolorations and gaps. This category of textiles is currently stored in cabinets and on rolls. In the survey it becomes clear that the textiles stored on rolls have suffered less damage that the ones stored in the cabinets. In the cabinets, the textiles are more stacked, and are folded, which can cause fixed folding lines and consequently tears. Because they are so stacked tight, the textiles are probably also more manipulated than textiles not stacked or folded on tubes. When a textiles has to be taken out, in a stacked cabinet, you have to manipulate a lot of the textiles. In addition, it is often necessary to search for the right textile, and the inventory numbers are not always easily accessible so textiles often have to be unfolded.



Besides material loss, gaps , tears, fixed folding lines are appearing damages in (parts of) **costumes** who are mainly stored in boxes and cabinets. In both storage mediums they are unsupported, stacked, and in the cabinets, folded. This way of storage contributes to the risk of further damaging the objects. The costumes are laying on the shelfs in the cabinets, sometimes in two or even three rows of stacks, one behind the other. Which makes it very difficult and dangerous to manipulate them when looking for an object, the bad identification on the objects does not help either. The inventory number are mostly attached with a small label and there is no uniformity in the placement of the labels are attached.



In the survey, 7 **masks** were observed, they were stored in cabinets. They all had a support but, they were not optimal, gaps and material losses were noticed.

The condition of the **3 dimensional objects** in the collection were relatively good, only material loss could be observed.

In the survey, ***negbwe's*** and **loincloths** weren't included, but a part (57) were observed by Sophie Gallant[10] in conjunction with her internship and thesis in 2022. The loincloths and the *negbwe's* were very fragile. They are made from leaves and they became very brittle. A lot of broken leaves and material loss could be detected, every time they are handled, there is material loss.



3.4.2 PROTOCOL FOR BEST PRACTICE OF THE CONSERVATION AND STORAGE FOR CENTRAL AFRICAN TEXTILE COLLECTIONS AND STORAGE ADVICE

a. Flat textiles

The majority of the textile collection are flat textiles which can be divided in different subcategories.

- Flat
- Hammock
- Mats
- Ribbon
- Velours du Kasaï
- Table cloth
- Blanket
- Bark cloth
- Certain types of Pagnes

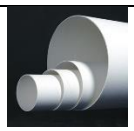
Flat textiles can be stored into different manners. The first method is by rolling the textile on a tube. Essential is, that the textile is in good condition and flexible. In the collection of the museum we have also flat textiles that are woven of plant fibers which can be dehydrated and hard which make it not only difficult to roll them on a tube but also dangerous, it enhances the risk of damaging the objects. The second method is to store the textiles flat. The table below shows the factors that must be taken in account for making the right decision.

Rolling	**Flat storage**
Less space required	More space needed
Labor intensive (making the tube)	Quicker
Less visibility of the object, needs to be unrolled	More visibility of the object
No folding lines	When the textile is large, it has to be folded, the folds needs to be supported
Textile needs to be in a good condition	Better for textile that is deteriorated
Gives more stress on the object	Less stress to the object, especially when the object is made of different layers

[10] The internship and thesis was in conjunction of the master program in the field of the Conservation and Restoration study at the University of Antwerp.

Rolling storage

1. **Tube:** The size of the roller is determined by the size of the textile. The diameter of the tube should be at least 100 times the thickness of the textile, but 200 times is recommended. If the diameter of the textile tube is too small, too much tension is created on the textile, but if the diameter is too large, rolling up is difficult. The length of the tube should be 10 cm longer on both sides than the textile, this way the roller can be easily picked up without touching the object.

Photo	Material	Advantages	Disadvantages
 Figure 73: https://www.jwb.nl/producten/archiveren-conserveren-restaureren/overige-zuurvrije-bergings-materialen/	Acid free cardboard	Acid free	Expensive
 Figure 74: https://www.tvp.nl/product/kartonnen-kokers/	Cardboard	Cheap	Acids
 Figure 75 : https://www.alb.be/nl/group/1885554/PVC-Buizen-electro	PVC	Strong	Heavy and difficult to handle With some types the possibility exist for the formation of hydrochloric acid

2. **Buffer:** The use of a buffer is needed when using non-acid free material. The roller should be buffered then with aluminum foil or Melinex®, which prevents damping acids into the object.

3. **Polyester fiber:** Makes the roll softer and ensures that the seams have support.

4. **Textile:** The roll needs to be covered with an unbleached and uncolored cotton.

5. **Tissue paper or tyvek:** Tissue paper or Tyvek are rolled with the object as interlayer. At the outside two layers of cover material is rolled, preferably Tyvek or cotton.

6. Object:

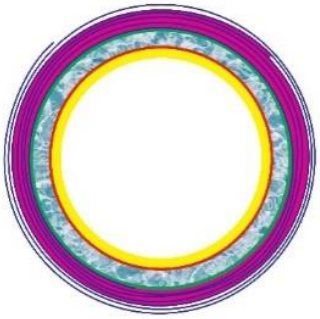
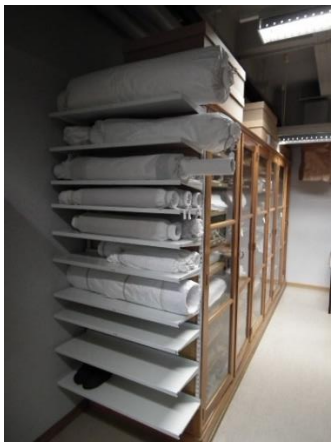


Figure 76: Cross-section of the tube

Rolling up the textiles is often done by several people, depending on the size of the fabric. One person per meter of fabric is recommended. The textile should be completely flat before rolling up the object. If it is a large piece of textile, it may also be rolled up on the floor, if it has first been completely cleaned. It is best to put acid-free paper such as Tyvek under the fabric to protect it. Before rolling up the fabric look at which side offers the best resistance to stretch tension against compressive stress, then decide which side should be rolled, facing outwards. The textile is always rolled up in the direction of the warp thread, although there are exceptions to this. The good side of the textile should always be on the outside of the roll. The side whose textile is in best condition is usually rolled up first. If there are thickenings in the textile, care is taken to ensure that these are on the outside of the roll so that they do not get squashed and so that you can roll up regularly.
Below a picture is shown of the tubes stored in the textile storage of the museum. These tubes are laying on a rack, which can damage the textiles, because of the pressure on the textile underneath the roll. In an optimal storage the rolls needs to be hanged on a rack or there are also special boxes were the tubes can be hanged in, but these are quite expensive.
The inventory number needs to be visibly attached to each roll on the outside that can easily accessed.



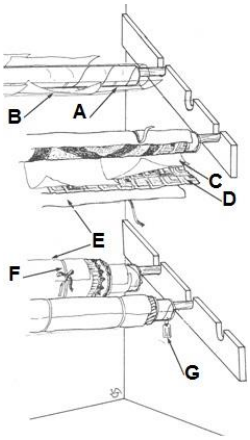


Figure 77: Rolled Storage for Textiles – Canadian Conservation Institute (CCI) Notes 13/3 - Canada.ca

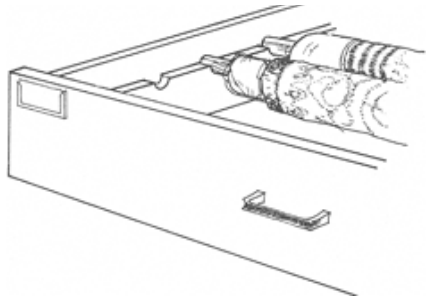


Figure 78 : Rolled Storage for Textiles – Canadian Conservation Institute (CCI) Notes 13/3 - Canada.ca

Figure 79 : Textile Rolling and Reorganization, Blog, Spurlock Museum, U of I (illinois.edu)

Flat storage

When the condition is bad, the textile is small or when the material doesn't allow to roll the textiles on a roll, they can be stored flat. It is best to avoid folds, or when not possible, to minimalize the amount of folds. It is important to support the textiles in the folds by using sausages of tissue paper. Below sketches on how to fold textiles.

The textiles can be stored flat in an acid free cardboard box, or drawers. When storing the textiles flat, a Tyvek sheet must be laid first or a solid cardboard so that the object can be lifted easily without too much manipulation. Textiles that do not need to be folded and can be lifted by one person could be never more than five objects, to keep them all easily accessible. It is preferable to layer each piece on layer of cardboard, with blocks of ethafoam glued to the sides, to keep the individual textiles separated.

Also with the flat textiles the inventory numbers must be visibly attached, at the outside of the box, front of the drawers, on the cardboards, separators.

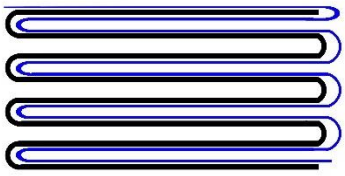


Figure 80 : Textile stored harmonica-like (black textile (purple tissue paper)

Figure 81 : Drawing of how pagnes with wavey edges best can be folded

Object specifics

Textile rolling on a tube is mainly for large textiles, that are in a good condition like shown above. Some textiles in the collection are made of stiff fibers, it is best to store them flat, because they can break easily by rolling them on a tube. Also a lot of the so-called flat textiles in the collection aren't completely flat, they may contain tiny pompons or other bulky additions. Small textiles can always best be stored flat since that is still the best way to preserve the textiles and they don't take up space.

Pagnes

The pagnes found in the Africamuseum collection can be divided into three types. The first type is a flat cloth that can be rolled on tubes if the condition allows it. The second type are the pagnes of the Kuba with wavy sides. Those kind of pagnes can be best stored harmonica-like. There are already some examples in the collection of custom made cushions to provide an optimal support for the pagnes.

Figure 82: Folded pagne, Kuba, Acquisitioned in 1924, EO.0.0.27927 (Courtesy of M. van Es, Collection of Royal Museum for Central Africa, Tervuren©)

Figure 83: Pagne, Kuba, Collected before 1910, EO.0.0.16469 (Courtesy of J.-M. Vandyck, CC-BY 4.0, Collection of Royal Museum for Central Africa, Tervuren©)

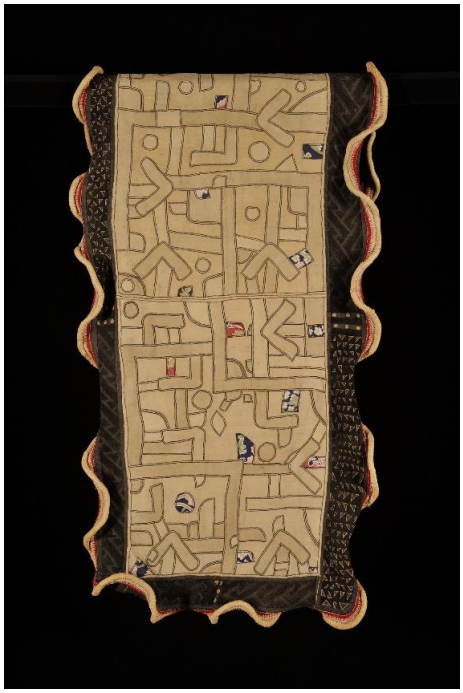


Figure 84: Pagne, Kuba, Acquisitioned in 1924, EO.0.0.27401 (Courtesy of J.-M. Vandyck, CC-BY 4.0, Collection of Royal Museum for Central Africa, Tervuren©)

Figure 85: Pagne, Pende, Acquisitioned in 1930, EO.0.0.32066-4 (Courtesy of A. De Paepe, Collection of Royal Museum for Central Africa, Tervuren©)

Figure 86: Pagne, Chokwe, Collected in 1931, EO.0.0.33780 (Courtesy of A. De Paepe, Collection of Royal Museum for Central Africa, Tervuren©)

The third type are pagnes have a starting cord with fringes attached to it. Some like figure 85 can best be stored flat in a box with as little folds as possible. When folds needs to be made, they have to be supported with rolled-up tissue paper. The pagne can best be laid down on a carboard tray so that the object can be easily lifted without touching the object. There is an exception, some pagnes can better be hung in the storage, but this depends on the material. Figure 86 shows a pagne that is damaged by laying down, the object is completely deformed. Figure 87 shows a way to hang these kind of pagnes on a bar, which will prolong the lifespan of the object.

Figure 87: Pagne, Kongo, Acquisitioned in 1914, EO.0.0.17317 (Courtesy of S. Genbrugge, Collection of Royal Museum for Central
Africa, Tervuren©).

b. 3-Dimensional objects

Cardboard boxes

Most of the 3 dimensional objects can be stored in a museum quality box, like shown below. The advantage is that the object is stored dust free in the dark. The cardboard box will also buffer fluctuations in temperature and relative humidity. It also allow to move the objects without manipulating the objects themselves. The disadvantage of these boxes is that you do not have an immediate view of the object, cannot have a good look on the objects inside when walking into the storage.

Inside the box, support systems are needed to preserve the objects. These systems are object specific and will be elaborated on the next pages.

Figure 88: Example of a cardboard box

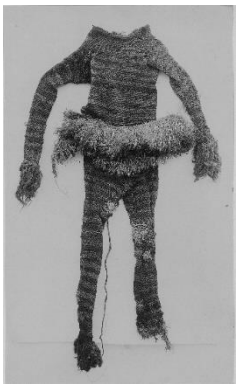
Object specifics

Negbwe's and Loincloths

The outline of the objects will be cutout in ethafoam and the cutouts will be covered with polyester fiber and Tyvek to support the object in an optimal way.

Costumes

- In costume boxes
- Supported with props of silk paper inside the costume
- No costumes may be stacked on top of each other
- When an object needs to be folded, wads of tissue paper are needed to lay into the fold for preventing permanent folding lines
- It is preferable to put all the parts of a costume on one box if possible



Masks

Masks can be best stored upright. An internal support has to be custom made with ethafoam, with a layer of polyester fibre and covered with cotton. For a small light weight mask a support without an ethafoam shape; with polyester fibre and cotton only, thus reducing labor and costs.

Figure 89: Mask, Binji, Acquisitioned in 1913, EO.0.0.15417 (Courtesy of J.-M. Vandyck, CC-BY 4.0, Collection of Royal Museum for Central Africa, Tervuren©).

Figure 90: Gitenga mask, Pende, Acquisitioned in 1989, EO.1980.2.1162 (Courtesy of J. Van de Vyver, Collection of Royal Museum for Central Africa, Tervuren©).

Miscellaneous

Some textiles will not fit in any of the above categories, making individual decisions of storage procedures, essential.

4. DISSEMINATION AND VALORISATION

4.1. CONTRIBUTION OF THE FOLLOW-UP COMMITTEE

During the project, four online meetings were organized through teams with the follow up committee. During these meetings, a PowerPoint presentation was used to present the progress of the research. The follow-up committee gave advice on the further course of the project and made adjustments where necessary.

Table 5: Members follow-up committee

Name	Affiliation	Institution	Land
Mark Nesbitt	Senior research leader in the collection department, Ecobotanical team	Kew Garden	UK
Casey Mallinckrodt	Object conservator	Denver Museum of Nature and Science	USA
Frieda Sorber	Curator of the historic collection of the ModeMuseum, Antwerp (retired 2020)		BE
Julien Volper	Art historian specialised in Central Africa	Royal Museum for Central-Africa	BE

4.2. SCIENTIFIC VALORISATION AND DISSEMINATION.

4.2.1. CREATION OF AN ONLINE PROTOCOL FOR BEST PRACTICE OF CONSERVATION AND STORAGE FOR CENTRAL AFRICA TEXTILE COLLECTIONS, ACCESSIBLE TO A BROAD PUBLIC

A conservation protocol is made based on the textile collection of the Africamuseum. These protocol can also be used for the preservation of small and larger African textile collections in other institutions and in private collections. The protocol will be published on the textile collection website of the Africamuseum (https://textiles-collection.africamuseum.be/en/).

4.2.2. WORKSHOP ON TEXTILE MAKING TECHNIQUES

On 3th March a textile workshop was held in the Africamuseum to bring stakeholders, researchers, textile specialists, conservators together for the discussing the results of the CAPTex project and to observe the analysed costumes. Different presentations were given by as well as the museum staff as externs like Viviane Leyman of Meise Botanical Garden and the artist Bren Heyman of the project “Futur-Velours.com”. The workshop was concluded with an interesting panel talk about textiles. The programme was as follows:

09:00 – 09:30 Welcome + Brief introduction of attendees *Siska Genbrugge*
09:30 – 10:00 Introduction to the project CAPTex *Anoek De Paepe*
10:00 – 10:25 Context of the objects *Dr. Julien Volper*
10:25 – 10:45 Inspection of costumes + discussion and feedback
10:45 – 11:00 Coffee break

11:00 – 11:30 Analysing the materials Anoek De Paepe, Viviane Leyman
11:30 – 12:00 Project Futur-Velours.com *Bren Heymans*
12:00 – 12:30 Inspection of costumes + discussion and feedback
12:30 – 13:15 Lunchbreak
13:15 – 13:45 Analysing the structures *Frieda Sorber*
14:45 – 14:10 Preventive conservation and treatment of the textiles *Anoek De Paepe*
14:10 – 15:30 Inspection of costumes + discussion and feedback
15:30 – 15:45 Coffee Break
15:45 – 16:45 Panel talk:
Georgine Dibua: Electronic engineer, coordinator, and project manager of Bakushinta
Stella Nyanchama: Anthropologists, curator of the exhibition Pagne Africain (Gent 2022)
Dr. Anja Veirman: Lecturer Anthropology of Arts, Textile Studies, LUCA School of Arts (Gent)
Casey Mallinckrodt: Object conservator, Denver museum of Nature and Science

For the workshop there were 17 participants (+ 4 from the paneltalk), the group was intended to be limited. A small informal meeting contributes more interaction among textile enthusiasts than a larger group. It is also easier and safer to show collection pieces to a smaller group. The participants were very versatile there were conservators, conservations scientists, students, researchers, weavers, etc..

Table 6: Participants of the workshop

Name	Affiliation	Institute/Company
Ina Vandenberghe	Responsible labo textile and metal,	KIK
Lucie Kaisala	Designer	TAMU Fashion
Kristin Van Passel	Textile conservator	Textiel studio Kristin Van Passel
Coen Eggen	Collector	
Marina Lamsens	Teacher of textile crafts, wool traditions, artistic expression	Middelbare Steinerschool, textiel-tuin- atelier ijzerpaleis Lier
Veerle Tytgat	Textile designer	Veerle Tytgat (www.veerletytgat.be)
Vera Roggli	Textile designer	TEXTILE DESIGN STUDIO (www.wiesiwill.com)
Mieke Delombaerde	Weaver	www.bindingen.wordpress.com
Anna De Maegd	Textile teacher	Villa Montald Sint Lambrechts Woluwe
Joke Vandermeerch	Textile conservator	http://joke.vandermeersch.be/
Katarina Peeters	Herbarium technician	Meise Botanical Garden
Peter De Groof	Textile conservator	Koninklijk Museum van het Leger en de Krijgsgeschiedenis, Brussel
Sara Boumkwo	Student: textile design aan LUCA	
Aline Huybrechts	Conservator	Mask Museum in Binche
Hilde van Asselberghs		
Henri Cosemans	PhD student	Universiteit Antwerpen
Karin Vercauteren		Indecor

The presenters at the workshop were:

Anoek De Paepe (Research assistant project CAPTex
Frieda Sorber (RMCA Volunteer, Textile specialist, former curator MOMU)
Siska Genbrugge (Coordinator Conservation and restoration lab and coordinator project CAPTex
Dr. Julien Volper (RMCA, Curator)
Viviane Leyman (Meise Botanical Garden)
Bren Heymans (Artist and founder of the project Futur-Velours.com)

Between the presentations there was time to observe 6 textiles that were selected for the CAPTex project. When choosing this 6, an attempt was made to choose 6 very different textiles with different structures. The textiles that were presented are shown below.

Top de mukanda
(EO.0.0.39174)

- Long sleeved top
- Maurits Bequaert, 1892 – 1973
- Acquisition date 1939
- Yaka

Circumcision costume with headdress
(EO.0.0.33776 -2+3+4)

- Long sleeved top with a rounded neckline and sewn on gloves, Leggings in looping with hide soles,Fringed pagne
- Gaston Fr. de Witte, 1879 - 1980
- Acquisition date 1931
- Chokwe

"Karotash" pur. Kangenye (lulua) (bèna mitunde)
Circumsisum (qui … ces enfants)(Top)
(EO.0.0.33659 -2)

- Pants consisting of a top piece, crotch and legs with attached feet with leather soles
- Gaston Fr. de Witte, 1879 - 1980
- Acquisition date 1931
- Luba

Circumcision costume
(EO.0.0.32066 -1+2+3+4)

- Long sleeved top with a rounded neckline with fringed wristbands, Leggings with fringed anklets, Pagne, Mask
- Pierre Golenvaux, ? – 1972
- Acquisition date 1930
- Pende

Cape de chef
(EO.1953.74.671)

- Rounded cape ending in stiff tassels
- Albert Maesen, 1915 - 1992
- Acquisition date 1953
- Mboma

The presentations gave an overview of the results of the CAPTex research, the analysis of the material and structures, the preservation, the context, and the problematic around the difficulties about gaining information about the textile making processes and the identification of the materials. The most interesting was that the textiles were looked at from different angles by peoples with different backgrounds. The social context of the textiles are also wildly discussed during the panel discussion at the end of the day which was very interesting. The panel discussion was moderated by Eline Sciot of the Africamuseum. The four participants of the panel discussion were:

Georgine Dibua: Electronic engineer, coordinator, and project manager of Bakushinta.

Georgine Dibua Mbombo is an electronic engineer, coordinator and project leader of Bakushinta asbl. Since 2007, her association has been dedicated to the appreciation of the different cultures of the Democratic Republic of Congo. Georgine organizes exhibitions, lectures and events. She is an expert on the participation of Congolese soldiers in both world wars. Georgine organizes trainings and walks on decolonization, and has already collaborated with several organizations, museums and municipalities in Brussels and Flanders. She is also part of the working group set up by the Brussels Region on decolonizing public spaces.

Since 2007, her association has been dedicated to the appreciation of the different cultures of the Democratic Republic of Congo. Georgine organizes exhibitions, lectures and events. She is an expert on the participation of Congolese soldiers in both world wars. Georgine organizes trainings and walks on decolonization, and has already collaborated with several organizations, museums and municipalities in Brussels and Flanders. She is also part of the working group set up by the Brussels Region on decolonizing public spaces.

She had organized exhibitions and conferences on raffia fabrics and other plant fibres through the renown of Kuba and Kongo fabrics, highlighting the technical knowledge of these peoples in the making of fabrics.

Stella Nyanchama: Anthropologists, chair of The ENAR (The European Network Against Racism), curator of the exhibition Pagne African

Nyanchama is a decolonial expert, Pan-Africanist, anti-racism activist, and defender of human rights. She is a consultant and campaign coach for the non-profit organization Hand in Hand against Racism. She is particularly engaged in campaigns to raise awareness and mobilise bottom-up initiatives that are focused on decoloniality. Moreover, she has more than 30 years of experience in voluntarism and activism in many civil organizations. Since 2022, she was elected as a Board Member of the European Network Against Racism (ENAR).

Nyanchama has two master's degrees, one in education and the other in social and cultural anthropology. She is currently pursuing a PhD in philosophy. Professionally, she has wide experience in job coaching, recruitment and placement, social mobilization, activism and protest, talent scouting, prospecting and coaching, and advocacy and lobbying for the implementation of a decolonial process. Currently, Nyanchama is the Director of the European Network for People of African Descent (ENPAD), the Vice President of Africalia, and a member of the Executive board of many other non-profit organizations: European Network on Religion & Belief (ENORB), Africa Diaspora Network Europe (ADNE), People of African Descent Business (PAD Business), Creative & Performing Artists Network (CAPA), and I See You (ISY). She is also the Founder and Curator of the Chama Artistic Creations, the Pagne Africain Textile Exhibition and the Kenya Kikwetu Abagusii Artefacts Exhibition.

Dr. Anja Veirman: Lecturer Anthropology of Arts, Textile Studies, LUCA School of Arts

Anja Veirman is an art historian and anthropologist, and teaches Anthropology of Arts and Textile Studies at LUCA School of Arts, where she also initiated a seminar on decolonisation and/in the arts. Since 30 years she works on the relationship between textiles and onto-epistemologies, and her PhD research with Senufo-communities in Ivory Coast, Burkina Faso and Mali focused on the relation between mudcloth and divination. This ongoing research leads to publications, and divergent forms of co-creation such as audio-visual installations.

Casey Mallinckrodt: Object conservator, Denver museum of Nature and Science

Casey is the head conservator of the Avenir Conservation Center at the Denver Museum of Nature and Science where her work is focused on collections of material culture, primarily Native American and First Nation belongings, textiles, and antiquities from the Americas. The Avenir Conservation Center uses community collaboration, technical analysis, and cross disciplinary research to deepen the understanding of these objects and to guide thoughtful stewardship, including facilitating the repatriation when requested.

Casey had the pleasure of visiting the Africa Museum for research and consultations several times between 2016 and 2019 as part of a conservation-curatorial project at the Virginia Museum of Fine Arts that carried out the technical analysis, study, and conservation of historic arts of Africa.

She received a master's degree in conservation from the UCLA/Getty Program in the Conservation of Archaeological and Ethnographic Materials, and an MFA is sculpture from the Yale School of Art. She is a trustee of the College of the Atlantic in Bar Harbor, Maine.

Below the questions that were prepared for the paneltalk. Unfortunately, time ran out and there was not enough time at the end to address all the questions.

INTRODUCTION: Would you please introduce yourself and tell us what your link is to textiles?

1. *Anja Veirman:* Textiles are found around the whole world, they can have different shapes and sizes and are made of a large variety of different materials, what are general characteristics of African textiles? Could you elaborate a bit more on the societal role of textiles? Since you conducted fieldwork in Africa, have you noticed a difference in the way people use textiles and interact with them? Can you give some examples of ceremonies or events during which textiles play an important role.

2. *Georgine Dibua*: The Congolese diaspora is a very diverse group of people, young and old, who all have a connection with their heritage. From your experience, what are the different perspectives of the Congolese diaspora on the traditional textiles and the traditional techniques. How do traditional textiles still play a role in the Congolese diaspora communities? Can you give an example. Is the traditional textile making craft still be appreciated and practiced nowadays?

3. *Stella Nyanchama*: Following up on the previous question. Has the traditional textile craftmanship influenced modern Congolese textiles and fashion? How are the traditional crafts incorporated in modern textiles? Can you give examples? What are your thoughts on the use of these traditional practices in the modern design world? How do contemporary Congolese Fashion designers contribute to the preservation of traditional crafts?

4. *Casey Mallinckrodt:* How do you, as a conservator, examine the textile structures and techniques of an object? Do you make mock-ups to understand how a textile is made, do you make drawings, are you connecting with people who are still practicing the traditional techniques? Can you give examples of studies that you conducted on a textile techniques? From your experience, what is the best approach to understand the processes used for the creation of textiles.

5. *Georgine Dibua:* You are conducting research on traditional weaving techniques. Are you in touch with textile makers that are known and produce traditional textiles? Can you discuss further the variety of textile creations in the DRC and the link with different cultural groups. Do you see possibilities for us, museum conservators, to work together and might it be interesting or feasible to organize recurring activities in the museum where we observe textiles together.

6. *Anja Veirman:* The textile collection that is housed at the RMCA has remained understudied. We have started the process of rehousing the textiles for better accessibility and the textiles are currently being digitally registered . How can we further valorize the collection and share the collection with a broader public? Do you have suggestions on what the role of the museum could/should be in the transfer of knowledge of traditional techniques? Do you think we need to have textiles that are easily accessible to students and other interested parties as a learning tool and (maybe) performance?

7. *Stella Nyanchama*: Some textiles were specifically created for ritual purposes. As conservators, we are often faced with the questions and doubts whether we are allowed to handle these objects and preserve them and if we preserve them in a respectful way. What approach do you suggest

to understand and take care of these textiles within the limitations of our profession (budget/time/cultural and language barriers). Do you consider the "use" of a textile object part of the preservation of the object, or does the textile has a new function when entering the museum?

8. *Casey Mallinckrodt:* What is your decision making process when treating an African textile and how do you balance the care of the material aspect of the object with the intangible element. How can we merge academical knowledge (material deterioration, physics) with the traditional and local knowledge of care that is present in source communities.

4.2.3. ONLINE CENTRAL AFRICAN PLANT FIBRE DATABASE

The plant fibre database is added to the existing database DaRWIN, which stands for "Data research Warehouse Information Network". DaRWIN is a database of Belspo, (Belgian Science Policy Office) for displaying collections. The database is an online open access database which give an overview of plant fibres of Central Africa. The database contains basic information of the fibres such as the inventory number, sample number, vernacular names, scientific names, the collector, place of collecting,… In the future the identification key features complemented with macro- and micro images by each fibre will be added.

Sort Specimen number ◉ Ascending ○ Descending

Specimen number	Taxonomical name	Types	Country	Locality	Specimen count
RMCA_001	Raphia vinifera P.Beauv.	specimen	R.D. Congo	Eala	1
RMCA_002	Raphia gentiliana De Wild.	specimen	R.D. Congo	Eala	1
RMCA_003	Urena lobata L.	specimen	Unknown	Unknown	1
RMCA_005	Musa x paradisiaca L.	specimen	R.D. Congo	Kalamu	1
RMCA_006	Hibiscus sabdariffa L.	specimen	Unknown	St. Giurbi/Auatude	1
RMCA_007	Hibiscus rosa-sinensis L.	specimen	R.D. Congo	Eala	1
RMCA_008	Hibiscus eetveldeanus De Wild. & T.Durand	specimen	R.D. Congo	Eala	1

Figure 91: Print screen of the database DaRWIN https://darwinweb.africamuseum.be/

4.3. NON-SCIENTIFIC VALORISATION AND DISSEMINATION.

4.3.1. SHARING THE KNOWLEDGE WITH STAKEHOLDERS AND CONGOLESE COMMUNITY, SHOWING THE INTRICACY OF AFRICAN TEXTILES INCREASING THE INTEREST IN THE COLLECTION.

See 4.2.2.

4.3.2. BETTER STORAGE OF THE TEXTILE COLLECTION, INCREASING THE PHYSICICAL AND DIGITAL ACCESSIBILITY OF THE COLLECTION.

The museum's database will be further completed with the information from the survey and the photos will be linked to the records, this will increase the digital accessibility of the collection.

The rehousing of the textile collection is currently on hold.

4.3.3.TRANSLATION OF THE SCIENTIFIC RESULTS TO THE BROADER PUBLIC THROUGH SOCIAL MEDIA IN COLLABORATION WITH THE SCIENCE COMMUNICATION DEPARTMENT OF THE RMCA AND MEISE BOTANIC GARDEN.

A website is made for the textile collection of the museum it can be found through this link https://textiles-collection.africamuseum.be/en/. The website will go beyond the project, it will become a website of the RMCA textile collection and other projects can be added to it, e.g. the rehousing project of the storage and future conservation projects. In this way the website will continue to exist after the project and more information about the collection will be disseminated to the scientific and non-scientific public. This will contribute to the valorisation of the collection over a long period of time.

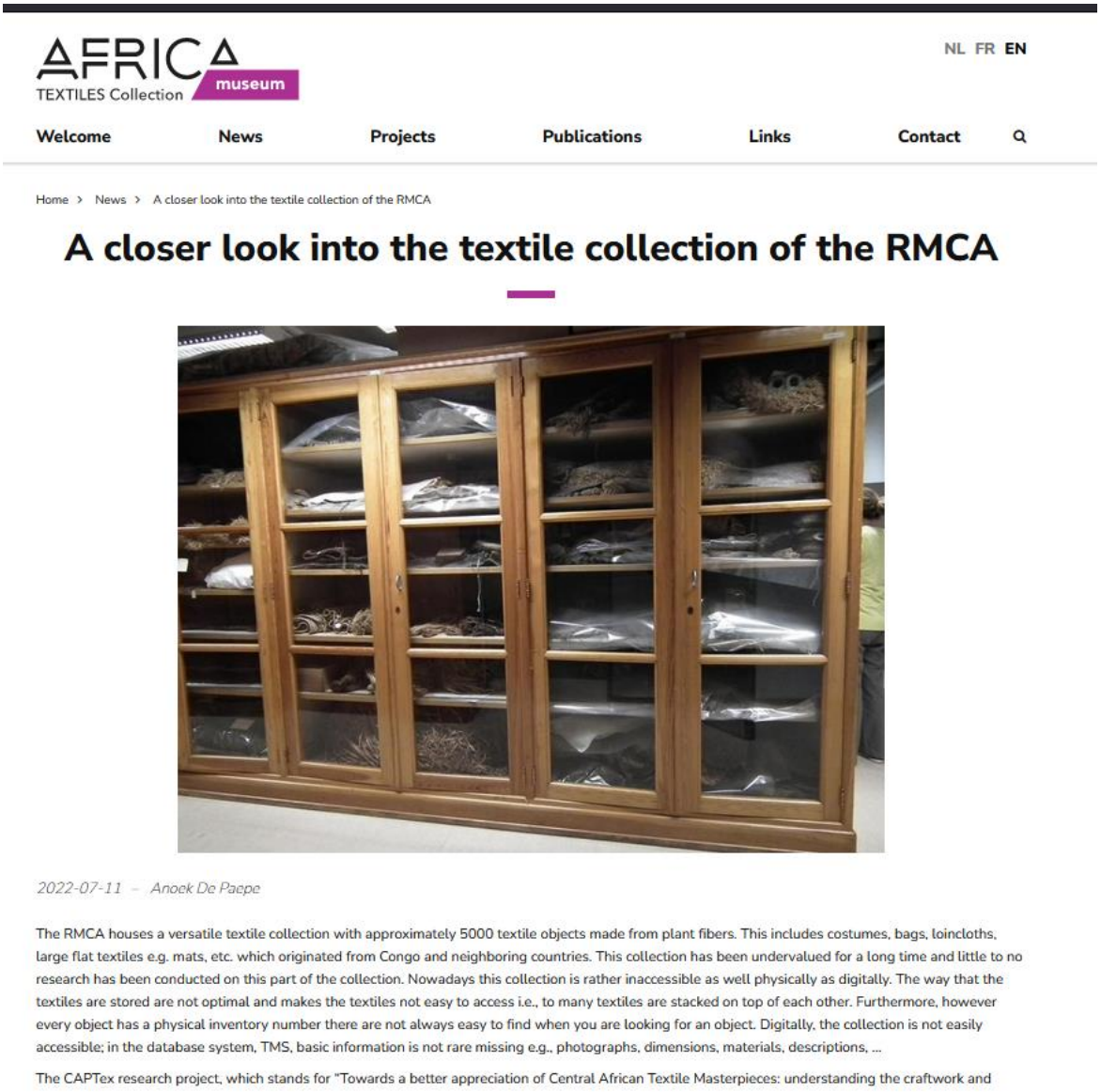


Figure 92: Printscreen of the website

5. PUBLICATIONS

Publications:

Submitted Peer-review Article on 15 October 2022 for the publication: "Scientific research in Cultural Heritage 2022" of the journal European Physical Journal Plus.

De Paepe, Anoek, Tshikuta, Liliane F., Genbrugge, Siska, and Stoffelen, Piet. 2022. 'Identification of plant fibers from Central Africa used for the creation of textiles and the creation of a reference database in framework of the CAPTex project'.

Work title latest article: Observations on materials and structures found on Central African plant fiber-based mask costumes

Anoek De Paepe, Frieda Sorber, Siska Genbrugge, Julien Volper, Viviane Leyman

Conferences:

inArt 2022: 5th International Conference on Innovation in Art Research and Technology – 28 June to 1st July 2022, Paris

"Identification of plant fibers from Central Africa used for the creation of textiles and the creation of a reference database in framework of the CAPTex project"

Science days – 17-18 October 2022 – Royal Museum for Central Africa

Textile workshop – 3 March 2023 – Royal Museum for Central Africa

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ANNEXES

A. DATA MANAGEMENT

CREATION OF A PROTOCOL FOR NAMING AND STORING PHOTO'S, MICROSCOPIC IMAGES, VIDEO'S ETC…

Objects and the plant fibre specimen were photographed with a black background, a colour chart and a ruler.
The photographs of the objects were named as follows:

- Object number _JJMM_CONS_creator_01

The photographs are stored on the museum's server, which is regularly backed up. They are linked to the museum's database The Museum System (TMS).

The images taken for analysis are named as follows:

- Label of the fibre: Object number_Sample no._YYMM_LABEL_creator_01
- Macro images: Object number_Sample no._YYMM_MACRO_creator_01
- Dino-Light: Object number _Sample no._YYMM_DINO_MAGNIFICATION_creator_01
- SEM: Object number _Sample no._YYMM_SEM_MAGNIFICATION_creator_01
- Microscopy Cross-section: Object number _Sample no._YYMM_MICRO-CROSS_MAGNIFICATION_creator_01
- Microscopy Macceration: Object number _Sample no._YYMM_MICRO-MACC_MAGNIFICATION_creator_01

The photographs are stored on the server of the museum, which is regularly backed up. The photographs of the plant specimen could not be added to TMS because they are not a part of the collection under the responsibility of the department of Archive and Collection management. The images will probably linked to DaRWIN through a IIIF server. The images needs to be saved in TIF, without compression in the Adobe RGB 1998 colour profile.

FORM WITH DIAGNOSTIC CRITERIA FOR PLANT FIBRE ANALYSES

Sample no°: **Inv.no°:**		**Taxa:** **Family:**
Image plant		Macro image plant fiber
English name: French name: Vernacular name:		
Region:		
Uses:		
Determination		
	Literature	Own findings
Color raw fiber		
Fiber length		
Hard/Soft fiber		
Elementary fiber length		
Elementary fiber diameter		
Surface morphology		
Form of elementary fiber		
Microscopy		
☐ Seed hair (Fibers that surround plant seeds, e.g. cotton, kapok) Surface section		
Birefringence		
Twist		
☐ Bast fiber (Fibers that are harvested from woody stems e.g. flax, hennep) Surface section		
Dislocations (kinks/nodes)		
Long length		
Taped ends		
Lumen		
☐ Monocot leaf (e.g. palm) Cross section		
Epidermis		
Vascular bundles (Xylem, phloem cells)		
Sclerenchyma bundles		
Stomata		
☐ Monocot stem (e.g. Grass) Cross section		
Outer cortex		
Vascular bundles (phoem, xylem, cambium)		
Epidermal cells		
Sclerenchyma bundles		
Microscopic images		

SEM Photographs	
Bibliography	
Reference images	

PLANT FIBRE MATERIAL AND TEXTILE TECHNIQUES ARE ADDED TO OBJECT RECORDS IN TMS
An initial database of the structures and techniques is made is Excel, see annex D. All the information in this file will be transferred to the museum database TMS. The terminology of the TMS is very Western oriented. So first, the correct terms needed to be added to the thesaurus so that the correct techniques can be linked to the objects. The terms that needed to be added are:

- Cordage (eng) , cordage (of koord twijnen) (nl) , cordage (fr) , Kordel zwirnen (de)

  cord or thread mading by twining 2 or 3 separate fiber or bast elements at the same time, done with the fingers of both hands, possibly rolled over a thigh as a temporary support

- Spinning (eng) , spinnen (nl) , filer (fr) , spinnen (de)

  making a single element thread by twisting fibers, using a spindle or other tool. Single twisted elements may be twined together to make a stronger thread

- Looping (eng) , lussen maken (nl) , textiles à mailles (fr) , verschlingen (de)

  building a textile or basketry structure by connecting individually made loops, using a short length of cordage or thread

- Braiding (eng) , vlechten (nl) , tresser (fr) , flechten (de)

  making a textile or basketry structure with multiple interlaced, interlinked of intertwined elements

B. RESEARCH OF LILIANE F. THIKUTA

CAPTEX PROJECT RESEARCH

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KINSHASA – DRC
June 2022

1

BOTANICAL GARDEN OF KINSHASA : I found neither documentation nor plant on traditional textile fibers, nevertheless an employee told me that this

AGAVE AMERICANA (AGAVACEAE) is a fiber plant. But I can't confirm that it was used for the making of traditional costumes.

COMMERCIAL SPACE IN LIMETE : I spoke to some art dealers about traditional textile fibers and a Kuba antique dealer told me more about the textile fibers and techniques of making kuba clothes.

Object made with PUNGA PUNGA fibers (MPUNGA MPUNGA, MPUNGALA,...)

PUNGA PUNGA FIBER BARK

STERM OF PUNGA PUNGA.

PUNGA PUNGA, PUNGA, PUNGALA, PUNG-PUNG, ...:

a native of the KONGO tribe told me that, he worked in the past in a plantation FERNADES company (belonged to a German CEO) where they produced textile fibers from the stems of **PUNGA PUNGA**, Whose scientific name is **PUERARIA JAVANICA**.

Amators pictures © L.Tshikuta

2

Tribe	Scientific name	Vervaculair Name	Plant fiber	Pictures and some explanations
Kuba	Arecaceae (Palm tree)	Ibwon'	Piok	Amators pictures/ © L.Tshikuta  **MBALA YIEM'** (tapis vierge) all the textiles are made first like this and then they will be soaked in a container with colored water made from the roots brought to a boil beforehand.  **SHOWA**  **MBALA ISHWEP'** (tapis brodé)  **NGONGO**
Luba & Lulua	Arecaceae (Palm tree)	Dibondo and Dipanda (two different palm trees, the one is taller than the other)	Mpeko	Raffia

3

All Bankundu tribes from : Oshwe / Mai-ndombe province	Arecaceae (Palm tree)	Bapeke (Ipeke single) is taller than Lokali (small palm tree)	Ndele but Mpekwa is called for young fibers	Raffia
Tiene (Batende) Village : Mpunyi/Yumbi/ Mongama/ Mai-Ndombe province	Arecaceae (Palm tree) ? (Cotton tree)	Mapiki Kutukungi	Nkia Kutukungi	Raffia Cotton tree
Yaka Village : Kabama/ Popokabaka/ Kwango province	Arecaceae (Palm tree)	Mpusu	Mayimba (Yimba is single)	Raffia
Yaka Village : Musamba/ Kenge / Kwango province	- Arecaceae (Palm tree) - ?	Mpusu Punga	Mayimba (Yimba is single) Kolokoso	Raffia Punga
Kongo village: Mbanza, Madimba,Ngufu/ Kwilu province)	Arecaceae (Palm tree)	Mpusu	Makoko (Koko single)	Raffia gentiliana

4

Kongo Village : Yongo/ Ngufu/ Madimba/	?	Punga-Punga	Pungala	Punga Punga
Yanzi Village : Nkimputu/ Bulungu/ Ndwe	Pueraria Javanica ?	Pung-Pung	Pung-Pung	Source : Former employee in the plantations of FERNADES company, producer of the Pung Pung fiber
Ekonda Village : Nkuma/ Bikoro/ Itipo/ Mbandaka/Equateur province	Arecaceae (Palm tree)	Bapeke (Ipeke single)	Belenge	Raffia Source of a pygmy : Bekaya is the traditional costumes made by Belenge fibers.

Punga Punga (Mpuga mpunga, Mpuga, Mpungala, Pung-Pung, Punga, …) and Cotton fiber :

The sterms are cut and stripped of the leaves after they will be soaked in a contenair filled with water for three days to two weeks (the number of days depends on the expected results) to get rid of the barks. You have to rub the sterms with hands to be sure that the barks are completely removed and then the sterms are removed from the water. These sterms are the fibers obtained which are dried under the sun. Finally, they can start making the traditinal costumes. Those fibers are white but they can be colored.

5

Sample of Punga Punga found during field investigations in a traditional craft market in Kinshasa/© L. Tshikuta

Sample of Punga Punga Fiber bark found during field investigations in a traditional craft market in Kinshasa/© L. Tshikuta

6

Raphia gentiliana (Arecaceae)
Synonyme : R. gilletii
Common names :
- Kikongo : Koko, ba di magusu, mawusu
- French : Palmier raphia
- English : Raffia palm


Traditionnellement, on tissait avec les fibres de raphia des jeunes feuilles un tissu, le « mbari », que l'on enroulait autour des reins pour les danses.

©Latham P, Konda K. B., Alliez J. L., *Plantes utiles du kongo-central, république démocratique du congo,* Vol 3, Armée du salut, SL., 2014, p. 661-662

Raphia matombe (Arecaceae)
Commun names :
- Kikongo : Tombe, ba di matombe
- French : Palmier raphia
- English : Raffia palm

Les fibres extraites des jeunes feuilles servent à faire des nattes, des tissus, des ficelles.

©Latham P, Konda K. B., Alliez J. L., *Plantes utiles du kongo-central, république démocratique du congo,* Vol 3, Armée du salut, SL., 2014, p. 664

7

Pueraria phaseoloides var. **javanica** (Fabaceae)
Common names :
- French : Kudzu tropicale
- English : tropical kudzu


La tige donne des fibres utilisables comme ficelles ou cordages.

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Triumfetta cordifolia (Malvaceae)
Common names :
- Kikongo : Mpunga, mpungala

Les fibres de la tige (lupungala, lupunga) ont donné lieu à une époque à un commerce important, en raison de leurs usages pour faire des cordes, des sacs et des emballages.

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8

Triumfetta rhomboidea (Malvaceae)
Common names :

- Kikongo : Mpunga mpunga, nsolokoto, makambala, kukula kinseke, mvongala,
- English : Burweed

L'écorce de la tige est fibreuse, au Kongo Central, on l'emploie pour faire des cordes, des ficelles et des attaches, elle est potentiellement un substitut du jute.

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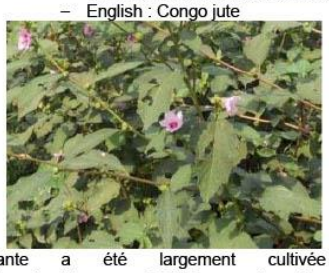
Urena lobata (Malvaceae)
Common names :

- Kikongo : Mpungala fioti, inkambwala, dinkambwadi, nkolokoso,
- Lingala : Lotiti moindu (Lingala),
- English : Congo jute



Cette plante a été largement cultivée pour la production de fibres en RD Congo dans les années 1950 à 1970, et l'est encore occasionnellement. La fibre est forte, fine, satinée. Elle a de bonnes propriétés pour la filature, et peut s'employer pour les cordages, les textiles, les tapis, les emballages, les tissus d'ameublement ; mélangée avec d'autres fibres, elle convient pour les sacs d'emballage. La plante résiste aux termites et à l'eau.

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Webographie

1. https://agritrop.cirad.fr/pdf
2. https://agriculture-afrique.com

Others source

1. Botanical garden of Kinshasa
2. Field survey of traditional art dealers
3. Investigation in the phytotherapy markets of Kinshasa

C. SAMPLED PLANT FIBRES

Sample	Catalogue number	Family (APD)	Taxa (author in ADP)	Place and date of collection	Collector
RMCA_042	1414	AGAVAC	Agave americana L.	Eala, 1925	Goossens
RMCA_039	4449	AGAVAC	Agave cantala (Haw.) Roxb. ex Salm-Dyck	St. Giurbi/Auatude, 1951	I.N.E.A.C.
RMCA_068	4449	AGAVAC	Agave cantala (Haw.) Roxb. ex Salm-Dyck	Station de Gimbi Mutadi, 1951	I.N.E.A.C.
RMCA_098	4449	AGAVAC	Agave cantala (Haw.) Roxb. ex Salm-Dyck	Station de Gimbi Mutadi, 1951	Unknown
RMCA_032	534	AGAVAC	Agave sisalana Perrine	Kalamu, 1910	Dept. Argiculture
RMCA_033	4447	AGAVAC	Agave sisalana Perrine	St. Giurbi/Auatude, 1951	I.N.E.A.C.
RMCA_041	1401	AGAVAC	Agave tequilana F.A.C.Weber	Eala, 1925	Goossens
RMCA_111	1765	AGAVAC	Agave tequilana F.A.C.Weber	Eala, 1928	m.a. Corbisier Baland
RMCA_040	1405	AGAVAC	Agave vera-cruz Mill. (syn. A. mexicana Lam.)	Eala, 1925	Goossens
RMCA_029	4454	AGAVAC	Agave vivipara L.	St. Giurbi/Auatude, 1951	I.N.E.A.C.
RMCA_048	4445	AGAVAC	Agave vivipara L. var. deweyana (Trel.) P.I.Forst.	Station de Gimbi Mutadi, 1951	I.N.E.A.C.
RMCA_025	819	AGAVAC	Furcraea foetida (L.) Haw.	Eala, 1909	Dept. Argiculture
RMCA_026	819	AGAVAC	Furcraea foetida (L.) Haw.	Eala, 1909	Dept. Argiculture
RMCA_050	4457	AGAVAC	Furcraea hexapetala (Jacq.) Urb.	Station de Gimbi Mutadi, 1951	I.N.E.A.C.
RMCA_074	1239	ARECAC	Arenga pinnata (Wurmb) Merr.	Eala, 1921	Dept. De l'Agriculture
RMCA_082	1240	ARECAC	Arenga pinnata (Wurmb) Merr.	Eala, 1921	Dept. De l'Agriculture

RMCA_014	1780	ARECAC	Arenga pinnata (Wurmb) Merr.	Eala, 1982	Corbisier Baland
RMCA_054	594	ARECAC	Hyphaene guineensis Schumach. & Thonn.	Congo, 1907	Pynaert
RMCA_002	541	ARECAC	Raphia gentiliana De Wild.	Eala, 1910	Granshoff
RMCA_020	1412	ARECAC	Raphia gentiliana De Wild.	Eala, 1912	Goossens
RMCA_108	3333	ARECAC	Raphia gentiliana De Wild.	Molegbe, 1949	R.p. Collaus
RMCA_060	1278	ARECAC	Raphia sese De Wild.	Lusambo, 1912	Dobbelaere
RMCA_001	543	ARECAC	Raphia vinifera P.Beauv.	Eala, 1910	Granshoff
RMCA_073	597	BOMBACAC	Adansonia digitata L.	Boma, 1909	Pynaert
RMCA_010	565	BROMELIAC	Ananas comosus (L.) Merr.	Eala, 1910	Granshoff
RMCA_075	1394	BROMELIAC	Ananas comosus (L.) Merr.	Eala, 1925	Goossens
RMCA_078	2663	BROMELIAC	Ananas comosus (L.) Merr.	Eala, 1936	I.N.E.A.C.
RMCA_063	237	DIOSCOREAC	Dioscorea sp.	Boma, 1910	Briselie
RMCA_016	1767	DRACAENAC	Sansevieria cylindrica Bojer ex Hook.	Eala, 1928	Corbisier Baland
RMCA_116	1767	DRACAENAC	Sansevieria cylindrica Bojer ex Hook.	Eala, 1928	m.a. Corbisier Baland
RMCA_083	1403	DRACAENAC	Sansevieria ehrenbergii Schweinf. ex Baker	Eala, 1925	Goossens
RMCA_017	569	DRACAENAC	Sansevieria hyacinthoides (L.) Druce	Bas-congo, 1897	Unknown
RMCA_090	571	DRACAENAC	Sansevieria hyacinthoides (L.) Druce	Eala, 1909	Jardin Botanique

RMCA_071	1400	DRACAENAC	Sansevieria metallica Gérôme & Labroy	Eala, 1925	Goossens
RMCA_099	1771	DRACAENAC	Sansevieria trifasciata Prain	Eala, 1928	m.a. Corbisier Baland
RMCA_104	580	EUPHORBIAC	Manniophyton fulvum Müll. Arg.	Unknown, 1907	Dept. Finances
RMCA_091	585	EUPHORBIAC	Manniophyton fulvum Müll. Arg.	Coquilhatville, 1897	Bunge At Anvers
RMCA_094	836	EUPHORBIAC	Manniophyton fulvum Müll. Arg.	Aruwimi, 1912	Dept. Finances
RMCA_084	984	EUPHORBIAC	Manniophyton fulvum Müll. Arg.	Eala, 1913	Dept. De l'Agriculture
RMCA_058	987	EUPHORBIAC	Manniophyton fulvum Müll. Arg.	Eala, 1913	Dept. Argiculture
RMCA_061	1417	EUPHORBIAC	Manniophyton fulvum Müll. Arg.	Eala, 1925	Goossens
RMCA_110	1559	EUPHORBIAC	Manniophyton fulvum Müll. Arg.	Eala, 1926	Goossens
RMCA_038	1775	EUPHORBIAC	Manniophyton fulvum Müll. Arg.	Eala, 1928	Corbisier Baland
RMCA_109	1776	EUPHORBIAC	Manniophyton fulvum Müll. Arg.	Eala, 1928	m.a. Corbisier Baland
RMCA_055	2588	EUPHORBIAC	Manniophyton fulvum Müll. Arg.	Luluabororg, 1936	Morlighem
RMCA_023	2327	FABAC	Crotalaria juncea L.	Eala, 1931	Corbisier Baland
RMCA_015	1429	LINAC	Linum usitatissimum L.	Katanga, 1926	M. Umeye Albert Gand
RMCA_093	1430	LINAC	Linum usitatissimum L.	Haut Katanga, 1926	umeye Albert Gand
RMCA_085	1392	MALVAC	Abelmoschus esculentus (L.) Moench	Eala, 1925	Goossens
RMCA_117	1407	MALVAC	Abelmoschus esculentus (L.) Moench	Eala, 1925	Goossens
RMCA_052	4462	MALVAC	Abelmoschus moschatus Medik.	Station de Gimbi Mutadi, 1951	I.N.E.A.C.
RMCA_088	4462	MALVAC	Abelmoschus moschatus Medik.	Station de Gimbi Mutadi, 1951	Unknown

RMCA_080	1422	MALVAC	Abroma augusta (L.) L.f.	Eala, 1925	Goossens
RMCA_028	2279	MALVAC	Abroma augusta (L.) L.f.	Eala, 1931	Corbisier Baland
RMCA_119	4460	MALVAC	Abroma augusta (L.) L.f.	Station de Gimba Matadi, 1951	I.N.E.A.C.
RMCA_097	4448	MALVAC	Abutilon angulatum (Guill. & Perr.) Mast.	Station de Gimbi Mutadi, 1950	Unknown
RMCA_059	1558	MALVAC	Abutilon indicum (L.) Sweet	Eala, 1926	Goossens
RMCA_031	2317	MALVAC	Hibiscus cannabinus L.	Eala, 1931	Lejeune
RMCA_087	2318	MALVAC	Hibiscus cannabinus L.	Eala, 1931	Lejeune
RMCA_096	2319	MALVAC	Hibiscus eetveldeanus De Wild. & T.Durand	Eala, 1931	Lejeune
RMCA_008	2320	MALVAC	Hibiscus eetveldeanus De Wild. & T.Durand	Eala, 1931	Lejeune
RMCA_007	1419	MALVAC	Hibiscus rosa-sinensis L.	Eala, 1925	Goossens
RMCA_024	1554	MALVAC	Hibiscus sabdariffa L.	Eala, 1926	Goossens
RMCA_006	4461	MALVAC	Hibiscus sabdariffa L.	St. Giurbi/Auatude, 1951	I.N.E.A.C.
RMCA_051	4461	MALVAC	Hibiscus sabdariffa L.	Station de Gimbi Mutadi, 1951	I.N.E.A.C.
RMCA_086	1413	MALVAC	Hibiscus tiliaceus L.	Eala, 1925	Goossens
RMCA_012	1428	MALVAC	Sida acuta Burm.f.	Ruanda, 1962	Dept. De l'Agriculture
RMCA_120	1769	MALVAC	Sida rhombifolia L.	Eala, 1928	m.a. Corbisier Baland
RMCA_105	4464	MALVAC	Sida rhombifolia L.	Unknown, 1951	J.M. Teteu Don Cotares

RMCA_095	591	MALVAC	Urena lobata L.	Eala, 1908	Pynaert
RMCA_003	3504	MALVAC	Urena lobata L.	Unknown, 1949	Soc cotol Anauoi ???
RMCA_027	4446	MALVAC	Urena lobata L.	St. Giurbi/Auatude, 1951	I.N.E.A.C.
RMCA_057	577	MARANTAC	Sarcophrynium schweinfurthianum (Kuntze) Milne-Redh.	Limbutu, 1910	Dept. Argiculture
RMCA_035	525	MUSAC	Musa acuminata Colla	Eala, 1909	Pynaert
RMCA_092	521	MUSAC	Musa acuminata Colla	Eala, 1909	Pynaert
RMCA_046	920	MUSAC	Musa rubra Wall. ex Kurz	Eala, 1905	Pynaert
RMCA_047	1281	MUSAC	Musa sp.	Lusambo, 1912	Dobbelaere
RMCA_053	1281	MUSAC	Musa sp.	Lusambo, 1912	Dobbelaere
RMCA_036	4455	MUSAC	Musa textilis Née	St. Giurbi/Auatude, 1951	I.N.E.A.C.
RMCA_021	522	MUSAC	Musa x paradisiaca L.	Eala, 1909	Pynaert
RMCA_005	529	MUSAC	Musa x paradisiaca L.	Kalamu, 1907	Dept. Finances
RMCA_118	1153	OLACAC	Ongokea gore (Hua) Pierre	Kasai, 1920	Achten
RMCA_009	2322	STERCULIAC	Melochia melissifolia Benth.	Eala, 1931	Corbisier Baland
RMCA_045	2322	STERCULIAC	Melochia melissifolia Benth.	Eala, 1931	Corbisier Baland
RMCA_103	830	TILIAC	Clappertonia ficifolia (Willd.) Decne.	Eala, 1913	Dept. Argiculture
RMCA_113	1777	TILIAC	Clappertonia ficifolia (Willd.) Decne.	Eala, 1927	m.a. Corbisier Baland
RMCA_081	578	TILIAC	Clappertonia polyandra (K. Schum. ex Sprague) Bech.	Eala, 1905	Pynaert
RMCA_066	1778	TILIAC	Clappertonia polyandra (K. Schum. ex Sprague) Bech.	Eala, 1928	m.a. Corbisier Baland

RMCA_067	536	TILIAC	Corchorus capsularis L.	Eala, 1908	Dept. Finances
RMCA_019	815	TILIAC	Corchorus capsularis L.	Unknown, 1913	Dept. De l'Agriculture
RMCA_013	531	TILIAC	Corchorus olitorius L.	Eala, 1902	Pynaert
RMCA_072	539	TILIAC	Corchorus sp.	Eala, 1903	Pynaert
RMCA_089	1279	TILIAC	Triumfetta	Lusambo, 1912	Dobbelaere
RMCA_115	1774	TILIAC	Triumfetta cordifolia A. Rich.	Eala, 1928	m.a. Corbisier Baland
RMCA_112	4458	TILIAC	Triumfetta cordifolia A. Rich.	Station de Gimba Matadi, 1951	I.N.E.A.C.
RMCA_022	4451	TILIAC	Triumfetta rhomboidea Jacq.	St. Giurbi/Auatude, 1951	I.N.E.A.C.
RMCA_044	4451	TILIAC	Triumfetta rhomboidea Jacq.	Station de Gimbi Mutadi, 1951	I.N.E.A.C.
RMCA_079	575	TILIAC	Triumfetta semitriloba Jacq.	Eala, 1910	Ganshof
RMCA_018	576	TILIAC	Triumfetta semitriloba Jacq.	Eala, 1905	Pynaert
RMCA_030	576	TILIAC	Triumfetta semitriloba Jacq.	Eala, 1905	Pynaert
RMCA_043	561	URTICAC	Boehmeria nivea (L.) Gaudich.	Mayumbe, 1905	Dept. Finances
RMCA_077	570	URTICAC	Boehmeria nivea (L.) Gaudich.	Bas-congo, 1905	Pynaert
RMCA_101	827	URTICAC	Boehmeria nivea (L.) Gaudich.	Eala, 1912	Dept. Argiculture
RMCA_076	1395	URTICAC	Boehmeria nivea (L.) Gaudich.	Eala, 1925	Goossens
RMCA_100	1557	URTICAC	Boehmeria nivea (L.) Gaudich.	Eala, 1926	Goossens
RMCA_065	2660	URTICAC	Boehmeria nivea (L.) Gaudich.	Eala, 1936	I.N.E.A.C.

D. ANALYSES TEXTILES

Inv. No.	Culture	Description form	Desgin	Construction	Main structure	Description cord of braid	Description sewing thread if present	Structure of surface decoration	Other elements and their connection	Repairs	Remarks
Eo.0.0.33776-3	Chokwe, 1931	Leggings in looping with hide soles	Legs have striped design, one leg also triangles and diamonds, diamond and triangle designs on the uppers	Worked from top to bottom and the boot from bottom to top; double starting cords 2s/z worked from bottom to top in single looping, the soles have fairly evenly spaced holes, a first row of leather strip overhand stitches connects with several rows of looping stitches, horizontal and diagonal bridge cords are the foundation for the diamond and triangle designs	Single looping; ca 14 rows/5cm; ca 11 stitches/5cm	Double starting cord 2s/z	For legging 1 the boot and the leg are connected with overhand stitches in yellow cordage	None	None	One legging has a repair of the sewing thread, using overhand stitches in a flat strip of fibre; in the leg just above is a circular repair with looping stitches worked from outside to centre	Both leggings have different designs and different sizes. Are they of the same outfit?
Eo.0.0.33776-4	Chokwe, 1931	Long sleeved top with a rounded neckline and sewn on gloves	Front of the body has big triangle designs, with smaller triangles on top; the back has a similar main design, but two ovals between the bridge cords connecting the sleeves	Worked from bottom to top over starting cords and bridge cords to make the lower, large triangles; afterwards the 2nd zone of triangles is made over other bridge cords; front and back are connected with bridge cord for the sleeves; the joke is then with decreases to shape the neckline, and with added bridge cords for the oval designs on the back. It is not clear whether front and back are worked in the round or as two separate panels, before the sleeve bridges that joins them. The sleeves are work top to bottom for about 9cm and then joined to lower sleeves worked separately over starting cords; the lower sleeves worked from to bottom and sewn onto the gloves. The striped gloves have starting cords over the fingers below the thumbs and are then worked from that cord to make the fingers, and from that cord to make the upper part of the glove to the arm. The left glove has bridge cords to make the fingers, the right glove not.	Ca 14 rows/5cm; ca 11 stitches/5cm	Starting cords and bridge cords	Top and lower sleeves and gloves sewn with overhand stitches	Front : over centre of diagonal and vertical bridges a conglomeration of wite stitches over a filling in western fabric or threads		Right glove thumb rea darns in black cotton sewing thread and brownish stiff fibre	Neckline of top is damaged, probably where a mask was connected

Inv. No.	Culture	Description form	Desgin	Construction	Main structure	Description cord of braid	Description sewing thread if present	Structure of surface decoration	Other elements and their connection	Repairs	Remarks
Eo.0.0.27150	Kete, 1923	Long sleeved top with straight neckline	Body and sleeves decorated with lozenges and chevrons	Double sz looping with added embroidery, worked from bottom to top and sleeves	Ca 14 rows/5cm; ca 11 stitches/5cm	Hem starts with a 2s/z cord; finish sleeves with 1 extra wefts looped zs over 2 loops of the main structure	Simple fibre bundles	Stem stitch, always double rows zs	None		Garment may be inside out. The designs only show to full effect if the longer floats of the design show on the front side
Eo.0.0.2931	Dengese, 1911	Rectangle in woven raffia fabric, 2 layers with a stiff layer in between,	Embroidered with kauri shells in triangular patterns	Between the 2 layers of woven fabric is a stiff fabric consisting of splints of wood (0,2-0,3cm wide) in a twill structure, the 'mat' is mostly hidden	Woven fabrics	None	Shells are sewn on with a thin 2s/z cord; left side has a cord connected every 3-4cm with an overhand knot with an extra twist	Sewn on shells	None		
Eo.0.0.30622-1	Luba, 1928	Stockings with feet	No design	Made in single s-looping with added sewn on leather soles	Worked from top to bottom in single s looping on a starting cord, ca 9 rows/5cm and 9 stitches/5cm; 27 cm from the starting cord a zone with single s-looping over a passive cord, no visible change in shape for a heel; leather soles sewn on	Starting cord 2s/z diameter 0,3cm	S strip of stiff golden yellow fibre ca 0,4cm wide, is used to attach the sole to the foot, using a braided stitch	None	None	Both repaired with a fibre bundle cord over the heel section; top of one repaired with 1 row of looping in a paler cord with a passive inserted cord	

Inv. No.	Culture	Description form	Desgin	Construction	Main structure	Description cord of braid	Description sewing thread if present	Structure of surface decoration	Other elements and their connection	Repairs	Remarks
Eo.0.0.30622-2	Luba, 1929	Stockings with feet	Irregular stripes of loops worked in opposite directions	Made from top to bottom in single s-looping and z-looping with added sewn on leather soles	Worked on single s and z looping in irregular stripes; significant distinctions in texture due to variations in working gauge, thickness of cords and s and z changes, the upper of the foot connects to the leather sole;2 rows of looping go around the upper which is connected with a flat strip of fibre ; the fibre is split at the top side of the sole	Starting cord, double cord 2s/z diameter0,2 - 0,4cm diameter for one stocking, 3s/z for the other	Flat strip of fibre ca 0;5cm wide	None	None		
Eo.0.0.32063-2	Pende, 1930	Black pants with crotch piece		Worked in one piece from top to bottom starting with the waist piece, crotch area damaged and repaired, legs tapered	Single looping; ca 5 rows/5cm, 5-6 stitches -/5cm	Starting cord is a 3 strand braid, ca 0,8cm diameter	Repairs in lower legs stitched with several different fibre	None	None	Stitched repairs in lower leges; crotch has a separate circular piece worked from outside to centre	
Eo.0.0.32063-3	Pende, 1930	Long sleeved top	Horizontal stripes; cross shaped wood object connected o front; abstract, embroidered design on front	Worked in one piece from top to bottom with a yoke, bridge cords added to make the sleeves; end of body with fringe	Single looping, with 2s/z cord, diameter ca 0,3cm; ca 10-12 rows /5cm, ca 6 stitches/5cm	Starting cord is a 3 strand braid, tapers to a 2s/z cord on one end	None	Embroidered abstract design in stem stitch , with occasional direction changes and chainstitch on front and back	Applied cross shape with strips of wood to the front		
Eo.0.0.32063-4	Pende, 1930	Fringed pagne	Pagne with ca 32cm long fringe	Starting border consists of 2s/z cord of bundled fibres	Double knots with raffia fibres over the d-cord	Staring border : 2s/z cord	None	None	None	None	The pagne seems unused, so may not be original to the costume which has signs of wear

Inv. No.	Culture	Description form	Desgin	Construction	Main structure	Description cord of braid	Description sewing thread if present	Structure of surface decoration	Other elements and their connection	Repairs	Remarks
Eo.0.0.33659-2	Luluwa, 1931	Long sleeved top with gloves	Round necked top with horizontal stripes in shades of tan, black and purple	Worked from top to bottom starting with a neckline cord worked over the shoulders in irregular lines, sometimes working backwards and forwards; bridge for one armhole visible, the other not because of repairs; the sleeves are worked downwards and taper before ending in individual fingers; the thumb is constructed first, the other 4 fingers 5cm lower; the body may have been constructed in horizontal rows, not circular. One side of the body overlaps the other and is sewn	Single looping-z; made in cordage 2s/z, 5 to 11 rows/5cm, 4-10 stitches/5cm; rows sometimes go back and forth over certain areas resulting in wavy stripes; increases are sometimes made with several stitches combined, which askes for bumps in the structure	Cordage same as cordage used for the looping, and worked into the structure		Black and purple stripes are painted	None	Rep over one armhole and corresponding side of bodice	
Eo.0.0.33659-3	Luluwa, 1931	Pants consisting of a top piece, crotch and legs with attached feet with leather soles	Horizontal stripes	The body has a 5cm high waist band worked from a starting cord upwards, though this is threaded a machine spun 3zs cord; around the upper legs are starting cords for the upper parts of the legs, the structure widens to make the crotch part and the body which connects with the waist band with overhand stitches; the legs are then worked downwards and upper flaps added over the uppers of the feet, these are done in rows instead of circular; leather soles are stitched on. The stitch direction varies in the body section	Single looping, mainly z but occasional s; ca 8-10 rows/5cm, ca 8 stitches/5cm	Starting cords	None	None	None	Several circular overlapping repairs, worked from outside to centre	The pants have been repaired several times
Eo.0.0.34	Tabwa,	Lattice of knotted cords hidden under fringe	Knotted fringe in horizontal rows	2s/z cordage runs diagonally over the surface. It connects with parallel cords running in the same directions	Knotted cordage forms the base for knotted fringe in o-horizontal rows	None	None	The fringe forms a looped knot over the horizontal rows of cordage	None		None
Eo.0.0.39174	Yaka, ?	Long sleeved top	Open work yoke and bottom section	Worked from top to bottom from a braided starting cord in s-looping and s-looping with an extra twist; the open top and bottom loops of ca 2-3cm, the body and sleeves ca 7 rows/5cm and ca 6 stitches 5/m	Single s-looping, double sz-looping, s-looping with extra twist	Starting cord, 195cm long, main structure flat 4 strand braid, twill, start and end round 4 strand braid	None	None	None		None

Inv. No.	Culture	Description form	Desgin	Construction	Main structure	Description cord of braid	Description sewing thread if present	Structure of surface decoration	Other elements and their connection	Repairs	Remarks
Eo.0.0.41105	Kongo, 1945	Rounded cape ending in stiff tassels	Lozenge designs and staggered triangles in open work	Worked from bottom of one side to the bottom of the other side over the shoulders in horizontal rows of stitches	The object consists of horizontal rows of extended or figure of 8 looping stitches, ca 40 stitches per 5cm and ca 3,5-5 rows/5cm; where two stitches are not connected a slit appears. The number of stitches increase from a width of 38cm to 82cm over the shoulders and decreases again towards the other bottom end of the garment. A large slit forms the neck opening, strengthened with buttonhole stitches ; long loops at bottom front and back, connect with a tassel	None	None	Short slits in 1 row only form openwork designs of lozenges and triangles; minimum 3 stitches between slits	Tassels consist of fibre bundles tied with cords. The fibre bundles are knotted together; the soft cords on the inside form the skirt of the tassel.		Objects 25684, 25685,25687, 45106, 53.74.671, 59.48.232, 67.63.2625, 67.63.2626, 79.1.308 are similar capes some in cordage some in spun cotton
Eo.0.0.966-[illegible]	Songola, [illegible]	Rectangle in a warp twined weave done in ply-splitting technique	Horizontal stripes in beige and black	Alternate cords in 2s/z and 2z/s form a warp they plies are split by a an untwisted fibre weft. 5warp cords/cm, 4 -5 wefts/cm	Same as construction	Finishing weft is a 3 ply cord over the warps	None	None	None		None
Eo.1948.27.31-2	Yaka, 1948	Pants consisting of a top piece, and legs	Horizontal stripes in beige and black	Worked from top to bottom over a braided starting cord, starts5 (originally 6) loops over the doubled braid, then body worked circular, a bridge cord to separate the legs, worked striped and tapered	Single looping in direction; rows/5cm, stitches /5cm	3 strand braid 0,8cm diameter	None	None	None		Damage in crotch area
Eo.1948.40.22-2	Pende, 1948	Pants, consisting of a top piece and legs with added, sewn on fringe	Horizontal stripes in beige and black	Worked from top to bottom over a braided starting cord, starts with loops over the doubled braid, then body worked circular, a bridge cord to separate the legs, striped and tapered; separate sewn on fringe	Single looping with 2s/z cordage, diameter ca 0,3cm, in direction; body ca 7 rows/5cm, 7 stitches/5cm; legs ca 10 rows/5cm , ca 8 stitches/5cm; fringe, knotted with sz double loop over a 2s/z starting cord	Starting cord body 3 strand braid, diameter ca 0,6-0,8cm; starting cord fringe : 2sz cordage	2sz cordage sewn about every 3 to 4 cm to the legs with a knotted stitch	None	None	None	

Inv. No.	Culture	Description form	Desgin	Construction	Main structure	Description cord of braid	Description sewing thread if present	Structure of surface decoration	Other elements and their connection	Repairs	Remarks
Eo.1948.40.22-3	Pende, 1948	Masque	Horizontal stripes; added cylinders for eyes and a circle for mouth	Worked from top to bottom, starts over a ring of twined cord, the worked in single looping direction, after 8 circular rows a rigid ring of a strip of fibre is attached with overhand stitches to the existing structure; an additional 24 cm is worked in single looping stitch to complete the masque. Eyes and a mouth are sewn on. The eyes are tubular, they consist of cylinders of single loping stitch worked over a passive strip of fibre (the left has 8 rows of passive fibre the left 7), holes are cut in the main structure to allow the wearer to see; a circular mouth is sewn on; at the bottom is a sewn fringe (length ca 20cm) , 2 rows of fringe consisting of double looping sz over 2sz cordage	Single looping direction, ca 0,4cm diameter	Starting cord masque 2sz cordage; fringe 2sz cordage ca 0,7cm diameter	To do		Added eyes and mouth		Left eye much finer worked than right eye; left eye ca 3stitches/1cm, right eye ca 1 stitch/1cm
Eo.1953.74.4151-1	Pende, 1953	Pants body crotch piece and legs, that flare out at the bottom	Horizontal stripes in black and tan	Worked from top to bottom over a braided starting cord: worked circular; two bridges are attached for the legs with a crotch piece n between	Single looping s direction with 2sz cordage diameter ca 0,2-0,3cm; ca 11 rows/5cm, 7 stitches/5cm	Starting cord 3 strand braid	Crotch bridges are connected with figure of 8 stitches in 2sz cordage similar to the cordage used for main structure	None	None	The crotch pieces has 4 bridge cords; some of these may be repairs; 1 repair cord connects with a big ca 16cm long repair on a leg ca 36cm below the body of the pants	

Inv. No.	Culture	Description form	Desgin	Construction	Main structure	Description cord of braid	Description sewing thread if present	Structure of surface decoration	Other elements and their connection	Repairs	Remarks
Eo.1953.74.4151-2	Pende, 1953	Long sleeved top with round neckline	Horizontal stripes in black and tan; mid front a piece of stem 7cm long, o,7cm diameter is sewn on	Worked from top to bottom over a starting cord; after making a yoke, two bridge cords are added to attach the sleeves, right arm too damaged to see the bridge; the body is worked over front and back and the sleeve bridges, the bottom remnants of 10 connections with different fibres to connect pants	Single looping s direction with 2sz cordage diameter ca 0,2-0,3cm; ca 11 rows/5cm, 7 stitches/5cm	Starting cord 3 strand braid	A stiff piece of fibre is used to attach the stem ornament		Applied stem ca 7cm long, 0,7cm diameter	Crude repairs in cordage over big holes in yoke, armpit and body; a big repair over the back, 20x19cm, is done with irregular single s looping in stiff cordage 2sz; diameter ca 0,2cm	
Eo.1953.74.	Pende, 1953	Pagne consisting of starting cord and k knotted fringes	None	Starting cord3 strand braid ca 0,6cm diameter; fringe, ca 13cm long knotted in double sz knot, ca 5 to 6 knots/5cm	Starting cord3 strand braid ca 0,6cm diameter; fringe, ca 13cm long knotted in double sz knot, ca 5 to 6 knots/5cm	Starting cord 3 strand braid, diameter ca 0,6cm	None	None	None	None	
Eo.1953.74.415	Pende, 1953	Ruff consisting of a starting cord and knotted fibre bundles	None	Starting cord 2sz cord, ca 0,3cm diameter; fringe, ca 16cm long knotted in double sz knot, ca 4 to 6 knots/5cm	Starting cord 2sz cord, ca 0,3cm diameter; fringe, ca 16cm long knotted in double sz knot, ca 4 to 6 knots/5cm	Starting cord 2sz cordage, ca 0,3cm diameter	None	None	None	None	Very worn, ends of fringe discoloured and frayed
Eo.1953.74.41	Pende, 1953	Ruff consisting of a starting cord and knotted fibre bundles	None	Starting cord is a single stiff brown fibre with fringe of bundled raffia fibres in sz double looping, ca 3 knots/5cm, length ca 17cm	Starting cord is a single stiff brown fibre with fringe of bundled raffia fibres in sz double looping, ca 3 knots/5cm, length ca 17cm	Starting cord a stiff brown fibre	None	None	None	None	Not much wear
Eo.1953.74.41	Pende, 1953	Ruff consisting of a starting cord and knotted fibre bundles		Starting cord is a doubled stiff brown fibre, 0,2cm wide, with fringe of 6 units, ca 19cm long bundled raffia fibres in sz double looping	Starting cord is a doubled stiff brown fibre, 0,2cm wide, with fringe of 6 units, ca 19cm long bundled raffia fibres in sz double looping	Starting cord doubled brown fibre, ca 0,2 cm wide	None	None	None	None	
Eo.1953.74.4151-9	Pende, 1953	Ruff, incomplete, consists of a fringe of a few looped fibre bundles ; knotted with cordage with overhand knots	None	No starting cord left only the knotting cordage, holding a few looped fringes ca 16cm long together	Knotting cordage 2sz over looped bundles of fibre		None	None	None	None	Incomplete; starting cord and part of the fringe probably missing

Inv. No.	Culture	Description form	Desgin	Construction	Main structure	Description cord of braid	Description sewing thread if present	Structure of surface decoration	Other elements and their connection	Repairs	Remarks
Eo.1953.74.4652-3	Lwalwa, 1953	Dark brown long sleeved top with neck piece	From 6cm from the waist the e tire top and sleeves are covered with knotted tufts that slant from left to right and upwards	Worked from bottom to top over a thick starting cord; the body is worked circular, then bridges are added for the sleeves, sleeves are the worked top to bottom; the yoke is added last ending at the neck opening; in the neck a rectangle is the added, dimensions not complete	Waist starting cordage - 2sz, diameter ca 0;8cm; worked with single z looping, stitches spaced about 0,5-2cm apart; tufts knotted with overhand knots are added to 1 in every 2 stitches, the knots are at the longest ca 1cm long, but may be abraded	Starting cord 2sz cordage, ca 0,8cm diameter	None	Tufts knotted with overhand knots are added to 1 in every 2 stitches, the knots are at the longest ca 1cm long, but may be abraded	None	Two repairs in the back; both done with thicker cordage, from outside to centre, with added knots	The top may have been smoked to provide the dark colour, strong smoke odour subsists
Eo.1953.74.4808	Salampasu, 1953	Long sleeved top with straight neckline		Worked from bottom to top on a starting cord of slightly s twisted raffia, diameter cm, worked in double sz looping with long loops; when the neck opening is reached, the neck is extended over 7cm and the arms are worked further up for 48cm continuing in the same direction.	Worked in double sz looping with long loops, ca 3 rows/5m, ca 4 double stitches/5cm	Starting cord of slightly s-twisted raffia	None	None	None	none	The object looks unused
Eo.1953.74.4876-2	Kongo (dinga), 1953	Short sleeved top with round neck opening and added flap in the neck	Covered with knots	Worked from bottom to top; from a braided starting border single z-looping in 2sz cordage, diameter 0,3-0,4cm; bridges are made for the sleeves, and the sleeves worked downwards; for the neckline 3 rows are worked from the body and sleeves upwards, a tangled part of a masque attachment on the back of the garment	Single z-looping in 2sz cordage, diameter 0,3-0,4cm, ca7 rows/5cm, 4 stitches/5cm	Starting border 5 element twill braid	None	Knots with overhand knot over each left element of a looping stitch	None	Masque attachment area very damaged, construction unclear	Heavily smoked, probably to provide the dark colour
Eo.1955.62.1	A-luena, 1955	Long sleeved top with rectangular neckline	Front and back each consist of a rectangular panel with a, the front with a design of 4 triangles, the back of a diamond and 4 corner diamonds, framed to the right and left with a rectangular panel	For front and back panel rectangles are made in starting cords, with added diagonals of starting cords; the designs are then worked in several directions: t the left and right shoulder pieces are then added; to do sleeve construction	Off-white, rust colour and dark-brown fibre, in single z looping with 2sz cordage, diameter cm; 11-15 rows/5cm; 9-13 stitches/5cm	Starting cords to do	A big repair piece is sewn onto the left breast, using overhand stitches in the same cordage as the rest of the piece	None	None	A big repair piece is sewn onto the left breast, using overhand stitches in the same cordage as the rest of the piece	

Inv. No.	Culture	Description form	Desgin	Construction	Main structure	Description cord of braid	Description sewing thread if present	Structure of surface decoration	Other elements and their connection	Repairs	Remarks
Eo.1962.10.113-1	Yaka, 1962	Long sleeved top with round neckline	Horizontal stripes, on middle front two ellipses one off white the other black, on back also ellipses	Worked from top down, starting with a braided starting cord ; yoke with single looping (direction; two bridges connect form and back and are used to work the sleeves, and part of the body; for the elliptical designs making a bridge to work the ellipse from outside to centre; at the bottom of the body 3 rows of stitches with a passive element, partly of contrasting colour.	Single looping direction; with 2sz cordage, diameter; ca 7 rows/5cm, ca 5 stitches/5cm	3 strand braid; diameter 0,7cm	None	None	None	None	
Eo.1962.10.113-2	Yaka, 1963	Pants with tapered legs, no foot wear	Horizontal stripes	Worked from bottom to top in single looping ?, circular , for the crotch a bridge is made from the doubled looping thread	Single looping direction ?; with 2sz cordage, diameter ?; top ca 7 rows/5cm, ca 3 stitches/5cm; legs : ca 11 rows/5cm, ca 6 stitches/5cm	3 strand braid ; diameter 0,8cm	None	None	None	?	
Eo.1979.1.1014	Chokwe, 1979	Pants with footwear	Horizontal stripes	Worked from top to bottom for the body to the beginning of the legs; the legs are made top down from starting borders about 34cm under the waist to the ankle and upwards to the body; where they are connected with figure of 8 loops. There is no special crotch treatment but there is some damage. 2 different shoes; one is connected with 1 thread. It has a big hole the heel. Probably worked from top to bottom but no starting cord; over the upper the stitches are worked in flat rows with knots on both sides. The left shoe connects with overhand stitches to the left. It has no starting cord and is probably made from toe to top with circular rows	Single looping ?; ca 5 rows/5cm, 6 stitches /5cm in sz cordage; ca 0,1-0,3cm diameter	?	Connection shoes to legs	None	None	Some stitching in the crotch area; holes in heel of right shoe and sole of left foot. The left foot has a circular repair under the ball of the foot.	

Inv. No.	Culture	Description form	Desgin	Construction	Main structure	Description cord of braid	Description sewing thread if present	Structure of surface decoration	Other elements and their connection	Repairs	Remarks
Eo.1999.12.3-1	Kuba (bushoong), 1999	Long sleeved shirt with round neck opening and neck slit in embroidered bark cloth	Embroidered kauri shells, cords and glass beads	Pattern pieces, sleeves, front and back in dark brown bark cloth; connected with open seams in 2sz cordage	Bark cloth	None	2sz cordage	Embroidery : kauri shells sewn through holes in the shells, glass beads strung on raffia fibre and connected with stitches between the beads; corded sections : a base cord is strung over the length of the decorated section, the decorating cord is looped around it, each loop penetrates the bark cloth.	Kauri shell, glass beads		In unused condition
Eo.1999.12.3-2	Kuba (bushoong), 1999	2 gloves	Embroidered kauri shell, cords s and glass beads	5 fingered gloves f-cut from one piece of bark cloth each, sewn with buttonhole stitches in 2sz cordage	Bark cloth	None	2sz cordage, ca 0,1cm diameter	Embroidery : kauri shells sewn through holes in the shells, glass beads strung on raffia fibre and connected with stitches between the beads; corded sections : a base cord is strung over the length of the decorated section, the decorating cord is looped around it, each loop penetrates the bark cloth.	Kauri shell, glass beads		In unused condition
Eo.1999.12.3-3	Kuba, 1999	2 leggings		Tapered leggings cut from one piece of bark cloth; connected with an open seam ; the top of each leg has 3 braids in brown fibre both legs are connected with a reinforcing piece of woven raffia fabric, each ca 10x9cm, sewn with raffia	Bark cloth	3 strand braid diameter ca 1,3cm	2sz cordage, ca 0,1cm diameter				In unused condition

Inv. No.	Culture	Description form	Desgin	Construction	Main structure	Description cord of braid	Description sewing thread if present	Structure of surface decoration	Other elements and their connection	Repairs	Remarks
Eo.1999.12.3	Kuba, 1999	2 shoes		Shoes made from 2 pattern pieces, a sole indication 5 toes and upper connection on the inside of the leg; seams with buttonhole stitches	Bark cloth	None	2sz cordage, ca 0,1cm diameter				In unused condition

E. LETTER FOUND IN THE: ETHNOGRAPHIC FILE N° 174 DA.2.175 WRITTEN BY VAN DEN BROECK, LÉON E. J. E ON 1 JUNE 1910 IN INONGO.

Inongo, le I juin I9I0.

Les Léopold II

Arts et Métiers.

I°) Fabrication des filets.

Il existe au district deux manières de filocher : la première se fait sans aiguille ni gabarit; elle sert à fabriquer les filets à larges mailles, exigeant une grande quantité de fil et destinés surtout à la chasse ou à la pêche de très gros poissons.

Les mouvements nécessaires à la confection de ces filets, sont fort compliqués; j'ai cherché, afin de rendre ce travail plus intelligible, à les démontrer par des photographies.

Ils peuvent cependant se réduire à cinq mouvements principaux; la plupart de ceux-ci se décomposant en plusieurs autres.

1° Mouvement.

Le nombre de noeuds nécessaires à la largeur du filet étant faits au préalable à la main, la corde à mailles ainsi formée est attachée à un soutien dans toute sa largeur, la maille devant servir à commencer le filochage, se trouvant à droite.

Saisir la ficelle entre le pouce et l'index, la main gauche près de la maille à relier.

Introduire celle tenue de la droite, PAR EN DESSOUS, dans cette maille; la saisir de l'autre côté (fig 2) la tirer en formant une grande boucle (fig 3 a) y introduire la droite et saisir à travers la ficelle et la boule (fig 4). Avoir soin que les ficelles restent à leur place.(Voir fig 3 en rouge et ficelles numérotées)

2° Mouvement

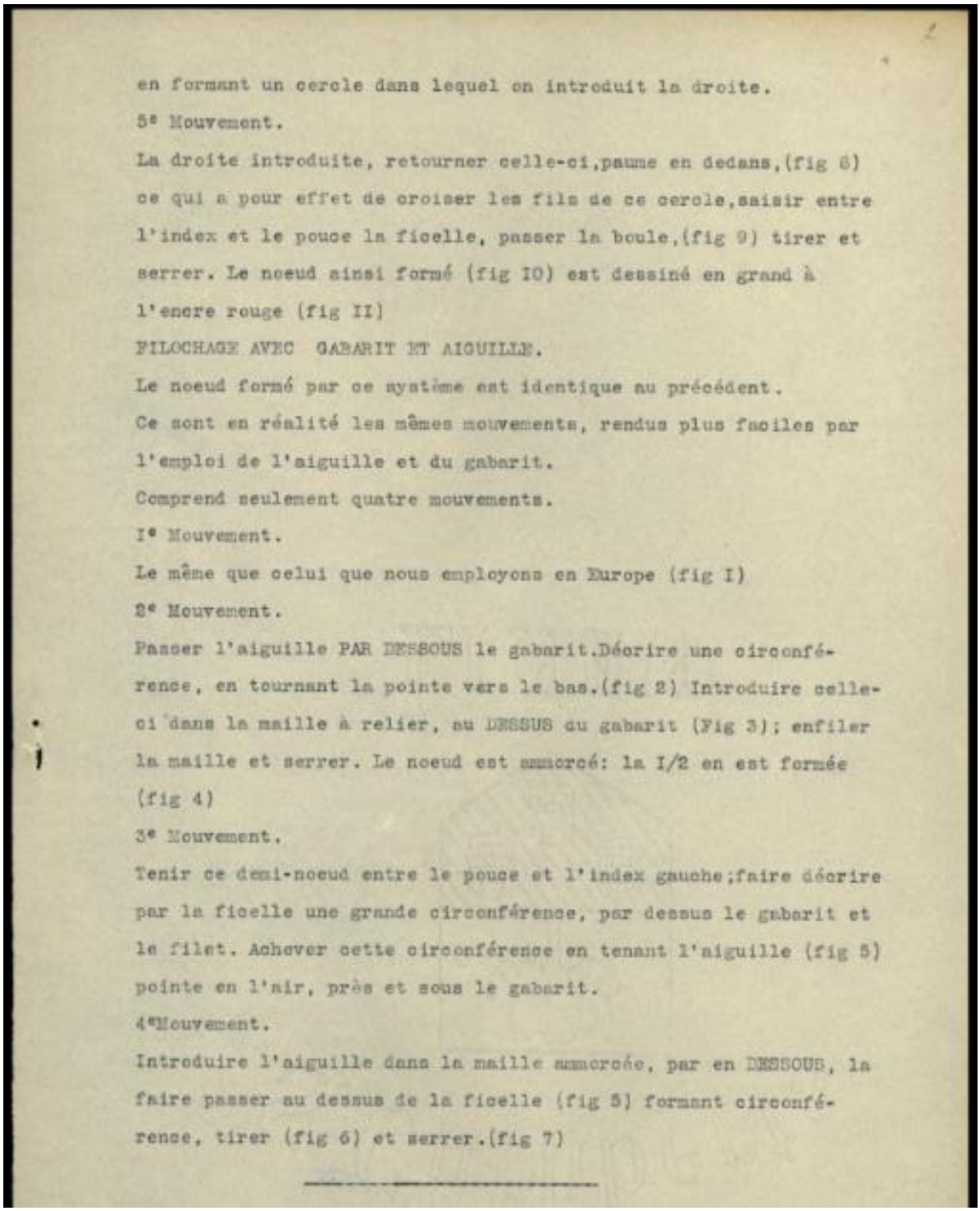
Serrer en tirant sur la boule, ce qui forme un demi noeud.(fig 5)

3° Mouvement.

Retourner ce demi-noeud en plaçant au dessus la ficelle de la droite ce qui transforme ce demi-noeud en une simple spirale (voir fig 6 en rouge) Rejeter cette ficelle au dessus du filet en formant un grand cercle (fig 7)

4° Mouvement.

Saisir de la droite,PAR EN DESSOUS,(fig 7) à travers la maille, la ficelle à sa partie marquée "b" en rouge. La tirer à travers



en formant un cercle dans lequel on introduit la droite.

5e Mouvement.

La droite introduite, retourner celle-ci,paume en dedans,(fig 6) ce qui a pour effet de croiser les fils de ce cercle,saisir entre l'index et le pouce la ficelle, passer la boule,(fig 9) tirer et serrer. Le noeud ainsi formé (fig IO) est dessiné en grand à l'encre rouge (fig II)

FILOCHAGE AVEC GABARIT ET AIGUILLE.

Le noeud formé par ce système est identique au précédent.

Ce sont en réalité les mêmes mouvements, rendus plus faciles par l'emploi de l'aiguille et du gabarit.

Comprend seulement quatre mouvements.

Ie Mouvement.

Le même que celui que nous employons en Europe (fig I)

2e Mouvement.

Passer l'aiguille PAR DESSOUS le gabarit.Décrire une circonférence, en tournant la pointe vers le bas.(fig 2) Introduire celle-ci dans la maille à relier, au DESSUS du gabarit (Fig 3); enfiler la maille et serrer. Le noeud est amorcé: la I/2 en est formée (fig 4)

3e Mouvement.

Tenir ce demi-noeud entre le pouce et l'index gauche;faire décrire par la ficelle une grande circonférence, par dessus le gabarit et le filet. Achever cette circonférence en tenant l'aiguille (fig 5) pointe en l'air, près et sous le gabarit.

4eMouvement.

Introduire l'aiguille dans la maille amorcée, par en DESSOUS, la faire passer au dessus de la ficelle (fig 5) formant circonférence, tirer (fig 6) et serrer.(fig 7)

F. MATERIALS AND SUPPLIERS

Acid free rolls	Preservation equipment (Prices are for 10 pieces) • Archival Storage Tubes -Tube 2100mm L - 76mmD (3") - 2mm wall thickness • Archival Storage Tubes -Tube 1219mm L - 76mmD (3") - 2mm wall thickness • Archival Storage Tubes -Tube 900mm L - 76mmD (3") - 2mm wall thickness	£232,00 (ex. VAT) £140 (ex. VAT) £115 (ex. VAT)
Unbleached Cotton Tying Tape	Preservation equipment 10mm x 100 m	€7,75 (ex. VAT)
	Route du papier 10mm x 100m (price from 2020)	€17,50 (incl. BTW)
	CAMI 13mm x 50m (price from 2020)	€8,64 (incl. BTW)
Tissue paper	Preservation equipment Acid Free Tissue paper sheets 750mm x 500mm - 20gsm (489 sheets)	£24,95 (ex. VAT)
Polyester fiber	Preservation equipment Polyester Batting and Wadding (1000mmx25m) 12 mm thick	£43,95 (ex. VAT)
Tyvek	Preservation equipment • Tyvek Roll (Grade:1623E) 1524mm x 100M • Tyvek Roll (Grade:1623E) 3000mm x 50M	£199 (ex. VAT) £206,40 (ex. VAT)
	Labshop Tyvek 1623 E 50m	€201,73 (incl. BTW)
	Kremer Tyvek 1623E roll length: 50 m, width: 152.4 cm	€168,19 (incl. BTW)
Unbleached cotton	Wildvanstof Baalkatoen (calico) 295cm	€ 9,95/m (incl. BTW)
Cotton stretch roll		
Polyester yarn	Veritas Allesnaaigaren polyester 1000 m Wit	€10,40 (incl. BTW)

G. POSTER SCIENCE DAYS

CAPTex

TOWARDS A BETTER APPRECIATION OF CENTRAL AFRICAN TEXTILE MASTERPIECES: UNDERSTANDING THE CRAFTWORK AND PRESERVING THE COLLECTION OF TEXTILES

Anoek De Paepe, Siska Genbrugge

AP.0.0.24240, 1928, Photo Rév. Père J. Vandeveldé, RMCAB

INTRODUCTION - The Royal Museum for Central Africa (RMCA) holds an exceptional collection of 6000 ethnographic and historic textile objects. An initial survey of the textiles in preparation of a planned rehousing effort revealed that the collection has not been properly catalogued and stored; even photographic records are missing for most artefacts. With exception of some well-studied Kuba textiles, little to no research has been conducted on the materials and techniques used for the majority of this collection. This project aims to study the Central African textile collection in order to: (1) Understand the technical processes of the creation of the textiles and link them with current textile making practices in Central Africa. (2) Document and classify the textiles. (3) Initiate a connection between the museum and crafts(wo)men who still use the traditional textile making techniques both in central Africa and in the diaspora communities. (4) Propose best storage and conservation practices for this collection. (5) Share the newly obtained knowledge with conservators and researchers in the field. (6) Make the collection and its information accessible to the public around the world.

STRUCTURES

Researcher examening the structures Photo S. Genbrugge, RMCAB

Detail Pende costume EO.1953.74.4151-2. Photo A. De Paepe, RMCAB

Drawing structure of braid, Cordage, Looping present in Pende costume EO.1953.74.4151, A. De Paepe, RMCAB

Cordage making, AP.0.0.15978, Photo J. Maes, RMCAB

The CAPTex project will try to fill the knowledge hiatus of structures and techniques of Congolese textiles. CAPTex focuses on a selection of garments from different cultures, regions and periods. All are created from plant fiber material and originate from the Democratic Republic of Congo (DRC). The main structures of these garments are identified as cordage, looping and braiding. These structures are rarely mentioned in the literature, as a result, a new terminology or specific structures had to be created, thoroughly described and incorporated into the database of the museum. From the extensive collection of masque-related costumes, almost 100 partial or complete costumes were structurally analysed during the project. Costumes are all tight fitting and cover the entire body. Different parts include long sleeved tops, gloves, pants or stockings and foot coverings. In a few types a head covering, a masque, is also included. Most costumes were worn with carved wooden masques. Some costumes have separate fringed skirts and ruffs. The main structure of almost all the costumes consists of loops worked with relatively short lengths of corded fibres. The working method, similar for all the objects examined, allows for shaping the garments as they are made, and allows for designs, consisting of stripes, diamonds and ovals. However, there are significant differences between the costumes, differences that are mainly related to the different cultures; but even within one culture structural differences can occur. Some costumes are more open worked than others, thus by some a needle must be used while others were be made without a needle. Starting methods for the costumes are different, some have a braid or a starting cord and other methods existed as well. Significant variances occur also in the shaping of the sleeves, gloves and shoes. Looping structures made with twined cordage are characteristic for all the costumes. A difference in fibres, diameters and stiffness of the cordage, and looping stitch counts allows for a variety of textures, ranging from very coarse, maybe intended for a single use, to intricate, intentional combinations of fine and thick cordage in one costume.

PLANT FIBERS

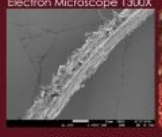
The materials of Congolese textiles are understudied, and no reference database of plant fibers used in Central-African textiles is currently available. A database will be created in order to be the main source for identifying the plant fibers in RMCA's collection. The identification of the plant fibers and their aging properties is valuable information to the conservator in order to respond to the degradation of the fibers and intervene in the storage conditions to extend their lifespan.

The museum holds a reference collection of 120 raw plant fibers that is used as the base for the reference database. The samples are examined using Macro observations, Polarized Light Microscopy, and Field Emission Scanning Electron microscopy to detect the key identification features of each sample. The different analyzing techniques are needed for analyzing the fibers.

MACRO photo

Dino-Light Edge Digital Macroscope 20X

Field Emission Scanning Electron Microscope 1300X



Polarized Light Microscopy Cross-section 20X

RG.1278_RMCA-060_Raphia sese De Wild

COMMUNITY

The project intends to involve researchers, specialists, and textile manufacturers specializing in Congolese textiles into the project since Congo has a rich textile tradition that is still practiced by many artisans and studied by Congolese experts. The involvement of Congolese textile makers and experts; and from the diaspora in the research is an added value, as they have a better knowledge of the materials and techniques that were and still are used, while conservators, can advise on the best conservation and management of textiles.

Map network

CONSERVATION

Knowing and understanding the materials and techniques of an object is one of the key elements for a successful passive and active conservation strategy. Deterioration processes can be predicted, and consequently the conservator can anticipate by slowing down the process resulting in an extended lifespan of the object. Knowing the source of the plant fiber and their manufacturing processes is important to make a balanced evaluation for the best conservation treatment, whereby the risks are known and can be calculated. Some costumes have visibly suffered from the active use before they entered the museum. There are costumes with discolorations in the areas of the armpits and under the feet. Some costumes were probable used more than once since they have evidence of repairs. Other costumes have no wear marks, which raises the question if they might have been intended for the tourist market. This project will result in a (pre)conservation protocol which will be incorporated in the rehousing project of the textile collection. The collection will be vaporized and it will be physically an digitally more accessible.

Storage textile collection. Photo A. De Paepe, RMCAB

Science Days: 17-18 October 2022, Royal Museum for Central Africa, Tervuren
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belspo

Plantentuin Meise

AFRICA museum