



## Symposium Volume



1<sup>st</sup> INTERNATIONAL CONSERVATION SYMPOSIUM-WORKSHOP

### Natural History Collections

18 - 21 September 2013

BARCELONA - SPAIN

### Conveners

Sandra Val



Steven J. Jabo



Smithsonian

Vicen Carrió



**Edited by**  
**Emanuel Tschopp & Sandra Val**

### Additional Scientific Editors

Koen Stein, Carla Alexandra Tomás, Ricardo Araújo, Octávio Mateus, Peter Falkingham & Rui Castanhinha

### Technical Editors

Silvia Costa, Emanuel Tschopp, Femke Holwerda



## TWO EXAMPLES OF PREVENTIVE CONSERVATION ACTIONS IN THE MUSEU DE CIÈNCIES NATURALS DE BARCELONA (MCNB): INSPECTION OF SPECIMENS AND SUBSTITUTION OF PACKAGING

Maria Vila<sup>1</sup>, Marta Pérez<sup>2</sup>, Olga Muñoz<sup>3</sup>, Eulàlia Garcia-Franquesa<sup>4</sup>

1- Museu de Ciències Naturals de Barcelona (MCNB), Barcelona, 08003, Spain

2- Grop, S.L., Museu de Ciències Naturals de Barcelona (MCNB), Barcelona, 08003, Spain

3- Art%, Museu de Ciències Naturals de Barcelona (MCNB), Barcelona, 08003, Spain

4- Museu de Ciències Naturals de Barcelona (MCNB), Barcelona, 08003, Spain

Emails: mvilaca@bcn.cat (MV); m.perez.cr@gmail.com (MP); ombblas@hotmail.com (OM); egarciafr@bcn.cat (EGF)

### ABSTRACT

Preventive conservation practices at in the Museu de Ciències Naturals de Barcelona (MCNB) includes various routine tasks. The periodical examination on the collections condition and the replacement of inadequate permanent packaging are only part of those tasks. This paper presents the methods and materials used by the MCNB conservation team for permanent packaging and specimen inspection and how both ensure better long-term conservation of the collections.

**Keywords:** Preventive conservation, permanent packaging, IPM (Integrated Pest Management)

### RESUMO [in Portuguese]

As práticas de conservação preventiva no Museu de Ciències Naturals de Barcelona (MCNB) incluem tarefas rotineiras. O exame periódico da condição das coleções e a substituição de materiais inadequados de acondicionamento permanente são apenas parte dessas tarefas. Este artigo apresenta métodos e materiais usado pela equipa de conservação no MCNB para acondicionamento permanente e inspeção de espécimes e ainda como ambos asseguram uma conservação melhor a longo prazo.

How to cite this article: Vila, M., Pérez, M., Muñoz, O. and Garcia-Franquesa, E. 2014. Two examples of preventive conservation actions in the Museu de Ciències Naturals de Barcelona (MCNB): Inspection of specimens and substitution of packaging. *Journal of Paleontological Techniques*, 13: 65-69.



Copyright (c) 2014 by Vila et al. This work is made available under the terms of the Creative Commons Attribution 3.0 Unported License, <http://creativecommons.org/licenses/by-sa/3.0/>.

## **INTRODUCTION**

---

Preventive conservation is a discipline that aims to improve the conservation conditions of museum collections before any damage or deterioration occurs, and involves the related activities to their surrounding space (ambient climate conditions, illumination, storage systems, etc). Its objectives are to prevent or minimize deterioration and delay aging processes. Actions taken for the dry oological and arthropod collection of MCNB are described herein.

## **MCNB DRY OOLOGICAL COLLECTION**

---

The MCNB chordate collection consists of 34.500 specimens, of which 724 are bird eggs, corresponding to 632 registered units. This group includes the oological collection which arrived at the museum as a deposit from the Royal Academy of Sciences and Arts on the 22nd of October 1926, as well as specimens from the collection of Barcelona's Zoological Park, provided over the decades of the 70's and 80's.

### **Actions taken**

The majority of the storage materials in this collection were not of the highest quality, thus not ensuring its long-term conservation or facilitating its handling or consultation. Therefore, it was decided that overall actions should be taken towards replacing all the inadequate specimen packaging (Figures 1A, 1C).

In order to improve the collection's packaging, criteria such as compatibility, quality, durability and harmlessness were taken into account, seeking materials that are chemically neutral and devoid of acids or other harmful components.

Attention was also paid to label and tag visibility. These should be readable without having to remove specimens from their housing and packaging. Standardization of dimensions and type of container, wrapper and /or support, and uniformity of techniques and materials used for each specimen group were also taken into account. This was all done having in mind the saving of space and materials, facilitating access to the specimens and searching for optimal insulation characteristics from temperature, relative humidity (Prieto and Uribe 2009; Szczepanowska et al. 2013) and vibration of the storage area.

## **Replacement of permanent packaging**

The first step was to remove the unsuitable or damaged storage materials in order to proceed with specimen dry cleaning. Subsequently a system of permanent custom made packaging was made for each specimen or specimen group, using polyethylene boxes with a lid (Standard Europe®) (Figure 1D). The interior of such boxes was covered with polyethylene foam, which served as a basis and fixation for the specimen. The contact area between the foam and specimen was secured with polyethylene fabric (Tyvek®) (Figure 1B) and, if necessary, special protections were applied (Fuller et al. 1992; Kishinami 1992; Davidson 2012; Figure 1D).

## **Results**

The entire oological collection has been changed between December 2012 to March 2013 using all the criteria and methodology that we mentioned before. Hence, long-term conservation was assured due to the improvement of storage materials and a minor manipulation of specimens.

## **MCNB DRY ARTHROPOD COLLECTION**

---

The MCNB arthropod collection consists of nearly two million specimens, the oldest dating back to the late 19<sup>th</sup> century. For the purposes of this action, approximately 150,000 specimens were selected, encased in 1,145 entomological boxes of different typology and arranged in 28 wooden cabinets.

### **Actions taken**

The objective of this action was the removal of any harmful elements, pest control and improvement of the storage systems. As in the previous case the employed criteria were based on compatibility, quality, durability and harmlessness of the chosen materials, which should be chemically neutral and exempt from acids or other harmful components. The applied methods were adapted to each specimen and container.

### **Methodology**

To improve the storage system, the damaged entomological boxes were repaired or substituted, non-standard outer labels were replaced, the box exterior was cleaned with cellulose paper and glass lid boxes treated with a neutral detergent.



Figure 1: Storage box with eggs before (A, C) and after intervention (B, D). A) and B) various types of eggs; C) and D) five eggs of *Dromaius novahollandiae*. Images: MCNB.

The interior was cleaned with air and fine brushes adapted to the needs of the stored specimens. Elements detached from specimens or labels were collected and placed in small tracing paper packets (made from transparent pulp cellulose with a neutral pH and free of acids and chlorine), which were fixed with entomological pins to the bottom of the boxes to verify the origin of their content. Later, these

elements were reattached to their correct place (Figures 2A, 2B). Loose specimens were fixed by means of entomological pins. Insecticide was renewed (a piece of cardboard impregnated with 1.27 g of transfluthrin of the trademark Baygon®) (Figure 2C), and if necessary, preventive quarantine was carried out by means of freezing the prepacked boxes at  $-18^{\circ}\text{C}$  for 20 days in airtight bags.



Figure 2: Storage box with arthropods after intervention. A) from Navás collection (Odonata: Platycnemididae); B) from Martorell i Peña collection (Coleoptera: Curculionidae); C) from MCNB collection (Hymenoptera: Scoliinae). Images: MCNB.

After these conservation procedures the specimen's state of preservation was evaluated in order to establish guidelines for future actions and the whole process was documented for internal archiving of the Museum.

## Results

From June 2012 to June 2013, 63 specimen boxes were repaired or replaced. Labels of 732 specimen boxes were changed and 1,145 specimen boxes were cleaned. In 468 specimen boxes, detached elements of specimens were collected and placed in small tracing paper packets. Forty-seven boxes included specimens that needed to be fixed. Insecticide was renewed in 1,145 boxes and quarantine was carried out in 218.

## CONCLUSIONS

The preventive conservation actions taken at the MCNB considerably improved the specimen storage conditions, while optimizing the

possibilities for their consultation or handling. However, to guarantee long-term preservation it is also necessary to ensure compliance with the recommended environmental standards (Quesada et al. 2011) of relative humidity, temperature and illumination, as well as to improve the pest control. Close monitoring will be essential for the future well-being of the collections at the MCNB.

## ACKNOWLEDGMENTS

We would like to thank the symposium conveners for inviting us to contribute to this special volume. Thanks go to the arthropod Collection curators Berta Caballero and Gloria Maso (MCNB) and to Olga Boet, the Chordate Collection documentalist at the MCNB for her assistance during the entire project. We also thank Steve Jabo (Smithsonian National Museum of Natural History) and an anonymous reviewer for providing comments that significantly improved an earlier version of the manuscript.

## REFERENCES CITED

- Davidson, A. 2012.** Cavity mounts for safe storage & handling. Available at <http://preparation.paleo.amnh.org/assets/Davidson-cavitymountsFinal.ppt> (May 2014).
- Fuller, T., A. Blount, and C. Bossert. 1992.** Support system for collections stored in jars; pp. 231–232 in C. L. Rose and A. R. Torres (eds.), *Storage of Natural History Collections: Ideas and practical solutions*. Society for the Preservation of Natural History Collections, Pittsburgh, USA.
- Kishinami, C. H. 1992.** Padding system for eggs in boxes; pp. 177–179 in C. L. Rose and A. R. Torres (eds.), *Storage of Natural History Collections: Ideas and practical solutions*. Society for the Preservation of Natural History Collections, Pittsburgh, USA.
- Prieto, M., and F. Uribe. 2009.** Effects of room temperature on the properties of some materials used in collection conservation. Available at [http://www.icp.cat/attachments/028\\_Prie](http://www.icp.cat/attachments/028_Prie)
- [to%20P%20&%20Uribe%20F\\_Effects%20of%20room%20temperature%20on%20the%20properties%20of%20some%20materials%20used%20in%20collection%20conservation.pdf](http://www.icp.cat/attachments/028_Prie) (May 2014).
- Quesada, J., E. Garcia-Franquesa, A. Díaz-Lorca, and M. Pérez-Azcárate. 2011.** Preventive conservation in the natural sciences museum of Barcelona (NAT): monitoring environmental conditions of zoological collections. Abstracts of the II Conservation Workshop. Institut Català de Paleontologia, Sabadell, Spain.
- Szczepanowska, H., F. W. Shockley, D. G. Furth, P. Gentili, D. Bell, P. T. DePriest, M. F. Mecklenburg, and C. Hawks. 2013.** Effectiveness of entomological collection storage cabinets in maintaining stable relative humidity in a historic museum building. *Collection Forum* 27:43–53.

Additional images and material can be downloaded at <http://www.jpaleontologicaltechniques.org/>