

出國報告（出國類別：開會）

## 參與國際組織 SPNHC 2023 之 學術交流與論文發表



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章晨玫研究助理（營運典藏與資訊組）  
派赴國家：美國  
出國期間：中華民國 112 年 5 月 27 日至 6 月 4 日  
報告日期：112 年 8 月 18 日

## 摘要：

本計畫係前往美國舊金山參與國際組織 SPNHC 2023 之學術交流與論文發表。自然史蒐藏保存學會 (The Society for the Preservation of Natural History Collections, 簡稱 SPNHC), 設立於 1985 年, 是一個致力於自然史蒐藏保存與管理, 且跨學科的活躍國際社群, 有 20 多個國家的會員, 這些博物館專家會員包含有策展人、蒐藏經理、保存／準備人員、資料庫管理人員 (curators, collections managers, conservators, preparators, and database administrators)。本館盼從 2023 年開始積極參與, 分享本館 30 多年在蒐藏研究與標本典藏管理的成效, 由 8 位研究同仁, 就分別專業領域, 進行學術發表。同時此行亦充分吸收學習, 廣結國際善緣, 促進國際博物館間的交流互動, 以及促動本館後續發展的契機。並期許本館在該學會中, 成為具有重要性的角色, 以張眼本館的國際能見度與實質貢獻度。

**【關鍵字】** 博物館、自然史、蒐藏保存與管理、蒐藏研究、蒐藏平台

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## 本文：

### 一、 目的：

設立於 1985 年的自然史蒐藏保存學會 (The Society for the Preservation of Natural History Collections, 簡稱(SPNHC), 是一個致力於自然史蒐藏保存與管理, 且跨學科的活躍國際社群。SPNHC 每年舉辦年會, 曾在紐西蘭 (2018)、美國 (2019)、英國 (2022) 舉辦。今年度 (2023) 5 月 28 日至 6 月 2 日在美國加州舊金山舉行年會, 本次會議的主題是“Taking the Long View”。2024 年年會則與國際生物科學聯合會生物多樣性信息標準會議 TDWG (Biodiversity Information Standards) 合開, 於 9 月 3 日至 7 日在日本沖繩舉行。2025 年將是自然史蒐藏保存學會設立 40 週年, 本館盼從 2023 年開始積極參與, 或許在 2023-2024 年可爭取開學會相關分工職位與任務, 並在 2025 年年會中, 成為具有部分重要性的角色, 並主動爭取本館成為 2027 年會的主辦單位。

### 二、 背景：

自然史蒐藏保存學會 (The Society for the Preservation of Natural History Collections, 簡稱 SPNHC), 設立於 1985 年, 是一個致力於自然史蒐藏保存與管理, 且跨學科的活躍國際社群, 有 20 多個國家的會員, 這些博物館專家會員包含有策展人、蒐藏經理、保存/準備人員、資料庫管理人員 (curators, collections managers, conservators, preparators, and database administrators)。自然史蒐藏保存學會會員每年會收到一份經審查的技術資訊期刊 (an annual journal of reviewed technical information), 兩期自然史蒐藏保存學會通訊 (SPNHC Connection)。學會的目的主要有四項：

1. 研究與關心自然史蒐藏的平台 (To provide and maintain an international association of persons who study and care for natural history collections)
2. 鼓勵自然史蒐藏的研究 (To encourage research on the essential requirements for preserving, storing, studying and displaying natural history collections)
3. 出版專業期刊 (To publish a professional journal, Collection Forum, and encourage the dissemination of information about natural history collections)
4. 舉辦年會 (To hold annual meetings and sponsor symposia and workshops to foster the exchange of ideas and information)

### 三、 過程

#### 1. 會議期程與地點

2023 年5 月28 日至 6 月2 日

Hilton San Francisco Union Square、California Academy of Sciences、University of California, Berkeley

#### 2. 參與人員

張鈞翔研究員兼研發長 (科傳中心/地質學組)；

姚秋如副研究員、黃俞菱助理研究員、林展蔚研究助理 (生物學組)；

陳淑倬助理研究員 (人類學組)；蔡經甫副研究員、

許美蓉助理研究員、章晨玫研究助理 (營運典藏與資訊組)

#### 3. 行程表

日期	工作記要
112/5/27	啟程，前往美國舊金山
112/5/28	報到，會議場地舊金山聯合廣場希爾頓酒店勘察
112/5/29	GBIF 工作坊
112/5/30	上午大會開幕，參與共同議程 下午加州科學院(CAS)參訪行程
112/5/31	分組學術發表會議
112/6/1	分組學術發表會議&口頭報告發表
112/6/2	參訪柏克萊大學植物園&蒐藏庫參訪行程
112/6/3	舊金山市區參觀
112/6/4	離開舊金山
112/6/5	抵達臺灣

4. 國際學術交流

#	交流形式 / 對象	目的 / 專業議題	負責人	本館組室
1	合作洽談 / SPNHC 2024 籌備委員會	<p>目的</p> <p>為提升本館在國際上的能見度及對國際社會的貢獻，將與 SPNHC 及 The Biodiversity Information Standards (TDWG) Organization 組成的年會籌備委員會洽談，將於2024 年9 月3 至7 日在OKINAWA 舉辦的年會中科博館可能參與籌備工作的細節。SPNHC 與 SPNHC 於 2018 年在紐西蘭舉行的年會有來自30 個國家（包含日本、臺灣）近400 人參加。TDWG 與 SPNHC 將繼續在之後的 2025 及 2026 年分別於美國與澳洲舉行，科博館將評估爭取2027 年主辦會議的可行性。</p> <p>專業議題</p> <ol style="list-style-type: none"> <li>1. 本館受邀評估在 OKINAWA 年會可參與的程度（We would be grateful if by responding directly to this letter you could indicate the degree of your interest in getting actively involved to make TDWG SPNHC 2024 Okinawa a success），例如參與「現場工作委員會」（serving on the local organizing committee），或是在會議期間提供現場後勤支援（providing on-site logistical support during the conference）。</li> <li>2. 本館受邀評估是否能主導「議程委員會」（Program Committee），包含支援語言翻譯（language translation support）： <ol style="list-style-type: none"> <li>A. 支援舉辦交流活動（support local arrangements for specific social events），</li> <li>B. 協助募款，或可能的話支付上述活動款項（help with the fund-raising, if possible, to defray costs for this event）</li> <li>C. 鼓勵更多社群參與，例如研究者、學生、相關專業者等（encourage participation of relevant communities（e.g., researchers, students, industry, etc.）。</li> </ol> </li> </ol>	張鈞翔	地質學組 科傳中心
2	專業對話 / SPNHC 會員	<p>目的</p> <ol style="list-style-type: none"> <li>1. 對於藏品管理的各項日常工作流程及執行方式吸取分享者的寶貴經驗，做為日後精進典藏工作</li> <li>2. 作業規劃之參考。</li> <li>3. 學習國外博物館藏品數位化及資料庫發展現況·做為未來本館相關規劃與管理之參考。</li> <li>4. 瞭解有關藏品安全維護及藏品盜竊案的處理。</li> <li>5. 學習在有限的經費資源下做蒐藏空間安排及對收藏櫃的評估建築體設計如何穩定環境的氣候條件，降低能源消耗及維護成本。</li> <li>6. 分享科博館的蒐典藏管理經驗與國外博物館建立交流管道。</li> </ol>	蔡經甫 許美蓉 章晨玫	營運典藏 與資訊組

2	專業對話 / SPNHC 會員	專業議題	<ol style="list-style-type: none"> <li>1. Back to the future: How can museum buildings enhance preventive conservation and collection management in changing environments?</li> <li>2. Collection Theft and Security Monitoring of Collections</li> <li>3. Collections and Conservation Work Within Professional Societies and Organizations</li> <li>4. DemoCamp: A live demonstration of software and applications relevant to the management, analysis, dissemination, and use of natural history collections</li> <li>5. RFID Technology and its Future in Natural History Collections [radio frequency identification 無線射頻識別系統]</li> <li>6. Tips and Tools for Managing Digital Biodiversity Specimens (featuring Symbiota) <a href="https://symbiota.org/">https://symbiota.org/</a></li> </ol>		
3	專業對話 / SPNHC 會員	目的	<ol style="list-style-type: none"> <li>1. 介紹本館真菌蒐藏特色。</li> <li>2. 了解蒐藏標本蘊藏的新應用價值與拓展研究領域, 以提升館內標本的利用機會。</li> <li>3. 了解國外博物館蒐藏管理方針, 尤其在經費不足下面臨到的老舊更新問題, 是否有較佳的解決方案。</li> </ol>	黃俞菱	生物學組
4	專業對話 / 加州科學院兩爬學組研究人員	目的	<ol style="list-style-type: none"> <li>1. 考察世界第六大的兩爬館藏 (來自 175 個國家共 315,000 件標本) 及其蒐藏空間、採集策略與管理方式, 以作為改善本館兩爬館藏管理之參考。</li> <li>2. 認識與拜訪加州科學院研究能量驚人的兩爬學組 (h-index=160, google scholar profile: <a href="https://reurl.cc/EGGIL1">https://reurl.cc/EGGIL1</a>), 了解其如何利用世界級的館藏與全球化的策略採集進行研究。</li> </ol>	林展蔚	生物學組
5	專業對話 / SPNHC 會員	目的	<ol style="list-style-type: none"> <li>1. 介紹本館民族學蒐藏特色。</li> <li>2. 交流了解蒐藏品的蘊藏價值與彰顯國加傳統文化特色。</li> <li>3. 探討國際博物館文物返還的爭議性話題。</li> </ol>	陳叔倬	人類學組
6	專業對話 / SPNHC 會員	目的	<ol style="list-style-type: none"> <li>1. 介紹本館海洋哺乳動物的蒐藏特色。</li> <li>2. 標本鯨豚類分子生物材料的國際交流與應用。</li> <li>3. 鯨豚標本(骨骼、組織)的維護與管理模式</li> </ol>	姚秋如	生物學組

## 5 論文發表簡冊

#	發表形式	發表主題	主講人
1	Oral Presentation, in-person*	蒐藏作為保育基礎：以臺灣國立自然科學博物館為例	張鈞翔*
2	Oral Presentation, in-person*	利用植物標本蒐藏研究葉片中的植物內生真菌群集	黃俞菱*
3	Lightning Talk, in-person*	藏於國立自然科學博物館之中藥傳說中的真菌	黃俞菱*
4	Oral Presentation, in-person*	臺灣各博物館返還人類學文物的族群差異現象	陳叔倬*

5	Oral Presentation, in-person*	探索scAnt 3D 模型平台對昆蟲標本的實用性:以臺灣國立自然科學博物館昆蟲標本館為例	蔡經甫*
6	Oral Presentation, in-person*	自然史標本與文物管理系統的發展：以臺灣國立自然科學博物館的經營實務為例	章晨玫*
7	Oral Presentation, in-person*	博物館藏品近用：以臺灣國立自然科學博物館蒐藏庫大開箱為例	許美蓉*
8	Lightning Talk, in-person*	蛇類眼睛大小之演化：探討其與生態、行為與生理特徵間之關係	林展蔚*
9	Lightning Talk, in-person*	臺灣自然史蒐藏中發現之真蜚與寄生蠅的爬行動物新宿主	林展蔚*

## 6 論文發表摘要

#	發表形式	投稿主題	摘要內容	投稿人	本館組室
1	Oral Presentation, in-person* (6. Collections and conservation work within professional societies and organizations)	The Collections as a Foundation of Conservation: The Case of the National Museum of Natural Science, Taiwan	The number of collections at the National Museum of Natural Science (NMNS) has reached a total of 1,644,680 since 1983. The majority of the collections are zoological specimens (60.7%), botanical specimens (20.7%), geological specimens (5.5%), and anthropological specimens (8.6%). Most collections were acquired during fieldwork by NMNS staff. A remarkable number of collections have been used for more than 350 special exhibits over the past 30 years and for scientific research by international scientists from nearly 20 countries. In this presentation, I will show how specimens provide evidence to support scientific research and how the research results can be presented in the form of exhibits. The collections (specimens and related information) are well suited to be shared with society through educational activities and exhibit interpretation, which are the basis for conservation of endemic and endangered wildlife in Taiwan.	張鈞翔*	地質學組 科傳中心
		蒐藏作為保育基礎：以臺灣國立自然科學博物館為例		章晨玫	營運典藏與資訊組
				郭揚義	展示組
2	Oral Presentation, in-person* (8. Hidden Diversity in Natural History Collections)	Using herbarium collections to study fungal endophyte communities in leaves 利用植物標本蒐藏研究葉片中的植物內生	Plant tissues contain cryptic diversity including pathogenic, epiphytic, endophytic fungi and other microorganisms. Fungal endophytes are fungi inhibiting within plant tissues without causing diseased symptoms. Ecological surveys of endophyte diversity require field sampling, fungal isolation, and identification. Fungal isolations from plant materials have to be finished in few days after sampling. Due to the geographic limitation, the number of acquirable	黃俞菱*	生物學組



		真菌群集	<p>plant specimens is limited, thus the depth and scale of fungal diversity and ecological studies might be restricted. With the advancement of DNA sequencing techniques, the high-throughput sequencing has become a mature technique and is widely used in the studies of fungal diversity in plants. Such studies usually use fresh plant materials and seldom use dried plant specimens for analyses. Herbarium plant specimens potentially preserve the fungal diversity. If fungal communities in fresh plants can be preserved in the dried plant specimens, we can know the variations of fungal communities from the past to the present and conduct the large-scale analyses in fungal ecology.</p> <p>Before using herbarium specimens to study the fungal ecology, three questions must be confirmed: (1) Are the endophyte communities different between fresh materials and dried specimens? (2) What are the differences of endophyte communities in the specimens deposited in different herbaria? (3) Do airborne fungi affect the fungal communities of herbarium specimens? This study analyzed the endophyte communities of the plant collections in the National Museum of Natural Science (TNM), the Herbarium of Biodiversity Research Center, Academia Sinica (HAST) and the Herbarium of Taiwan Forestry Research Institute (TAIF) in Taiwan, using Illumina Miseq paired-end sequencing method. Our results reveal that both fungal diversity and community structure are not different between fresh plants and dried specimens, and the fungal diversity of plant specimens deposited in the three herbaria are similar, while the community structures are significantly different. Additionally, few overlaps of fungal species between herbarium airborne fungi and plant specimens infers that the airborne fungi have limited effects on the fungal communities in plant specimens. Overall, herbarium collections are promising resources for studying the fungal diversity.</p>		
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3	<p>Lightning Talk, in-person* (13. specimen Spotlight)</p>	<p>A legendary mushroom of traditional Chinese medicine in the National Museum of Natural Science, Taiwan.</p>	<p>“Lingzhi” is a legendary fungus which has been used in the traditional Chinese medicine for more than 2000 years. <i>Ganoderma lucidum</i>, a common <i>Ganoderma</i> species in Europe, has been used as the scientific name of Lingzhi in China for decades. However, the European species is not the Lingzhi in East Asia. In 2010, Dr. Sheng-Hua Wu, the former curator of the National Museum of Natural Science collected a <i>Ganoderma</i> specimen in China. Based on the molecular and morphological studies, his research group determined the specimen belongs to a new species and named the species as “<i>Ganoderma lingzhi</i>”. The holotype specimen is deposited in the National Museum of Natural Museum. In fact, the legendary Lingzhi and the commercial Lingzhi which have been cultured in Taiwan and China are <i>G. lingzhi</i>, not <i>G. lucidum</i>. I am impressed by this specimen when I first became the collection manager of the museum, not because of the beautiful shape of the specimen, but the fact that what we called Lingzhi for a thousand years is a newly discovered species which was published in recent years!</p>	<p>黃俞菱*</p>	<p>生物學組</p>
		<p>藏於國立自然科學博物館之中藥傳說中的真菌</p>			
4	<p>Oral Presentation, in-person* (10. Return of the Specimens: Repatriation of Natural History Objects)</p>	<p>The Ethnic Differences of Repatriating Anthropological Relics in Taiwan Museums</p> <p>臺灣各博物館返還人類學文物的族群差異現象</p>	<p>Since 1980s, both Han and Indigenous peoples have made requests to the museum for the repatriation of cultural relics, but so far, only the Han cultural relics have been returned. Regarding to the history of anthropological collection in Taiwan museums, the National Taiwan Museum started in 1915, and the National Taiwan University started in 1928, in the Japanese rule period. The Academia Sinica was established in China in 1928 and moved to Taiwan after Civil War in 1949. Most of the anthropological relics of these early established museums were collected by researchers in the fields. After 1980, more than a hundred of museums were successively established in Taiwan. However, as dealers entered the antiquities markets, most of the anthropological relics collected in the newly established museums were purchased from dealers.</p> <p>In contrast, human bones were only collected in National Taiwan University by physical anthropologists before 1960s. In 1973, the skeleton of an indigenous leader who died in the rebel against Japanese regime in 1930 was repatriated by National Taiwan University. However, this is the only repatriation case so far for indigenous relics, and the human bones. No any other indigenous relics were repatriated after 1973, and still many bones have</p>	<p>陳叔倬*</p>	<p>人類學組</p>

		<p>been sought to return but still unsuccessfully.</p> <p>Till now about 10 Han cultural relics have been returned from different museums to Han communities. In contrast, none of indigenous cultural relics have been returned. Ironically, from 2012 to the present, 4 indigenous cultural relics collected in the museum have been registered as Taiwan National Treasures due to Cultural Heritage Preservation Act. Among them, in order to apply for the National Treasure position, National Taiwan University invented new</p> <p>marriage and brotherhood ceremony for university museum and the relics-originated indigenous communities, so that the community would agree the university museum to keep collecting their relics. These two ceremonies aroused criticism about the whether the National Treasure policy have the adverse effects of keeping ancestral objects permanently out of the indigenous communities from which they originate.</p> <p>Why Taiwan museums were easier to return Han cultural relics than to return indigenous ones? Since most the curators, collection managers, researchers, and officers in Taiwan museums are ethnic Han, indigenous relics were easily being seen as others' relics. We were easy to negotiate the management of our people's relics due to the same ethnic background, but hard to deal with other's relics with others. Today, there is no indigenous curator or collection manager employed in Taiwan museums, and is no indigenous theme museum in Taiwan. Therefore, indigenous talents will be the most critical factor in reversing this situation.</p>		
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5	Oral Presentation, in-person*	Exploring the Utility of the <i>scAnt</i> 3D Model Platform for Insect Specimens: A Case Study of the Entomological Collection at the National Museum of Natural Science, Taiwan.	The primary objective of museums is to effectively utilize collections for research, education, and exhibitions. Research and interpretation of specimens is crucial in understanding the past, present, and unlocking the future, and thereby preserving and sharing the evidence of natural history specimens and human artifacts. Museums are repositories of numerous physical specimens, but their accessibility and publicness are impeded by preservation and access restrictions. Digital access to natural history specimens has emerged as a trend to reach a wider online audience through methods such as 2D images, 3D digital modeling, virtual reality, and augmented reality. However, generating 3D models of small objects, such as insects and arthropods, poses challenges. To address this, we have developed a macro 3D scanner (an open-source platform called <i>scAnt</i> ) and a photogrammetry software package that processes extended depth of field images from 180 captured perspectives to produce 3D models and images. These images are integrated into an online browsing platform, allowing for simultaneous display of 2D and 3D images at a corresponding angle, compensating for any obscured features in the 3D model and reducing the risk of misjudgment. These used in educational exhibitions, enhancing public engagement and interaction. The system is useful for establishing a type specimen database, and also enables digital access to other rare or precious specimens. high-throughput 3D models and images can also be used in educational exhibitions, enhancing public engagement and interaction. The system is useful for establishing a type specimen database, and also enables digital access to other rare or precious specimens.	蔡經甫*	營運典藏與資訊組
		探索 <i>scAnt</i> 3D模型平台對昆蟲標本的實用性：以臺灣國立自然科學博物館昆蟲標本館為例		王惟正	台甲部
		黃耀霆		台甲部	
		鄭明倫		生物學組	

6	Oral Presentation, in-person*	Exploring the Advancement and Implementation of the Archival Management System for Natural History Specimens and Artifacts: A Case Study of the National Museum of Natural Science	<p>The National Museum of Natural Science (NMNS) in Taiwan was established in 1986 and consists of four service departments and three collection-based research departments in Biology, Geology, and Anthropology.</p> <p>The research departments are divided into 10 divisions that study various natural history specimens and human artifacts. The museum holds 19 collections, with a total of 1.64 million specimens, with insects, other animals, and plants being the largest portion. The Collection and Information department manages the museum's collections, coordinates operations, and catalogs research results and metadata (taxonomic names, images, labels, molecular data, measurements, etc.).</p> <p>The Entomology division, for instance, has recorded and cataloged 4070 type specimens of 955 insect species from 105 families.</p>	章晨玫*	營運典藏與資訊組
		自然史標本與文物管理系統的發展：以臺灣國立自然科學博物館的經營實務為例	<p>The NMNS has been using a collection management system for over 20 years, but it has become outdated and is not compatible with current platform and technology. To address this issue, the NMNS has implemented a new system in 2017, the Ministry of Culture's Archival Management System in phases, which has been transformed into a comprehensive collection management system. The system prioritizes collections and multi-disciplinary resources, records metadata, allows for data searches, and provides flexibility for exhibitions, education, and research. The system is also designed to be open for integration with other technical applications and to support OPEN DATA, connecting cultural resources and enriching their value. The main benefits of the new system are to integrate collections into digital museums, and improve the efficiency of collection management.</p>	李銘峰	臺中科技大學
				蔡經甫*	營運典藏與資訊組

7	Oral Presentation, in-person*	Making Collections Accessible to the Public: A Case Study of the National Museum of Natural Science in Taiwan	Museums have shifted their focus from being "object-oriented" to "visitor-oriented" in recent times, recognizing the value and importance of visitor experiences. The National Museum of Natural Science (NMNS) in Taiwan is known for its well-regarded collections and management. Various groups visit the museum for purposes including teaching, research, and collection identification, with university students being a common visitor demographic. With the goal of community service, museums should leverage their collections to fulfill their obligations to the public. On January 1, 2023, the NMNS held the "Unpacking Storage: Visiting the Insect Storage and Herbarium and their Preparation Areas" event. The results of a post-visit questionnaire indicate that participants were highly positive about the activity and hope to see it repeated regularly in the future. This study aims to share the event and explore how collections can help foster a sense of identity among the public. Ultimately, the museum profession should use its social influence to support sustainable development of nature.	許美蓉*	營運典藏與資訊組
		博物館藏品近用：以臺灣國立自然科學博物館蒐藏庫大開箱為例		蔡經甫*	營運典藏與資訊組
8	Lightning Talk, in-person*  (13. specimen Spotlight)	The evolution of eye size in snakes: exploring the interplay between eye size and ecological, behavioral, and physiological traits	Eye size plays a crucial role in determining visual acuity, sensitivity, and temporal resolution, reflecting adaptations of vertebrates to their environment. By examining 1,176 specimens of 33 snake species in Taiwan, we explored the relationship between relative eye size and ecological (i.e., habitat), behavioral (i.e., diel activity pattern, foraging strategy), and physiological traits (i.e., the presence of pits) in six snake families. We found that terrestrial and/or diurnal snakes tend to have a larger relative eye size, indicating the evolutionary response to changes in habitat type and activity patterns. However, we found no evidence of effect of foraging strategies or the presence of pits on eye size, suggesting that snakes may have similar visual demands regardless of how they hunt or the existence of infrared system. Our findings shed light on the adaptive significance of visual performance in snakes, as well as the interplay between behavior, ecology, physiology, and phylogeny in the evolution of optimal vision.	廖鎮磐	生物學組
		蛇類眼睛大小之演化：探討其與生態、行為與生理特徵間之關係		林展蔚*	生物學組
		黃文山		生物學組	
		館外二位作者		常春藤高級中學、臺灣大學	

9.	Lightning Talk, in-person*  (13. specimen Spotlight)	New reptile host records of Ixodida and Diptera found in Taiwanese natural history collections	Natural history collections have played a crucial role in the study of parasite biology in recent years, particularly in understanding diversity and host association patterns. By revisiting specimens preserved in alcohol, new host records can be discovered and insights into the extent of association between parasitic species and their host spectrums can be gained. We examined 5,298 squamata specimens in Taiwan for parasite infections and found two key results. First, five new host species of reptile-associated tick <i>Amblyomma helvolum</i> in Taiwan were discovered: Taiwan japalure ( <i>Diploderma swinhonis</i> ), long-tailed sun skink ( <i>Eutropis longicaudata</i> ), Taiwan kukri snake ( <i>Oligodon formosanus</i> ), brown forest skink ( <i>Sphenomorphus incognitus</i> ), and Chinese green tree viper ( <i>Trimeresurus stejnegeri</i> ). These new records expand the known host association and distribution of this tick and its role as vector of reptile-associated microbes. Second, we found a case of subcutaneous myiasis caused by larvae of a parasitic fly on the throat region of a five-striped blue-tailed skink ( <i>Plestiodon elegans</i> ). This is the first reported case of skink myiasis in Taiwan and the first case for the genus <i>Plestiodon</i> . Both findings contribute to the knowledge of the parasite diversity associated with reptiles and highlight the importance of natural history collections in uncovering diversity in parasite biology and the significance of preserving and revisiting these collections for future research.	林展蔚*	生物學組
		臺灣自然史蒐藏中發現之真蜱與寄生蠅的爬行動物新宿主		館外五位作者	中研院、臺灣師範大學、臺灣大學、Smithsonian Institution、北海道大學

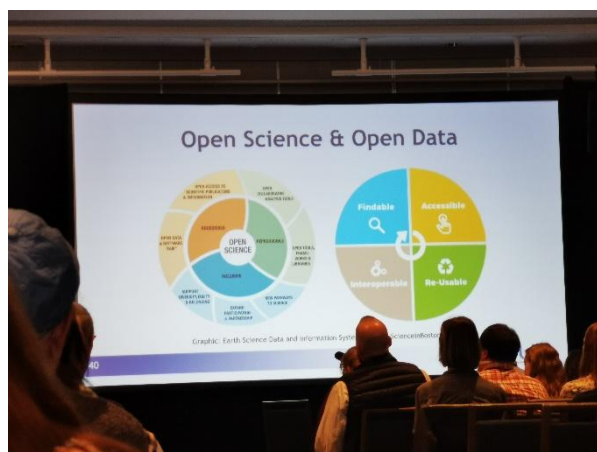
## 四、 成果

### 1. GBIF 工作坊 (5/29)

GBIF 所舉辦的工作坊，分為 GBIF - Unified Data Model for Mobilizing and Sharing Collections Data 與 GBIF - Making Your Collections Data Discoverable。

GBIF 致力於為全球生物多樣性訊息和數據提供開放利用的平台，經由統一的數據模式，將藏品的數據整理和組織起來，能夠被更廣泛地使用、瀏覽、交流與管理，讓來各地的館藏數據得以被看見，便於數據的交流與共享。工作坊透過案例講解，並經由學員分組以實際數據動手操作，更快速、明瞭 GBIF 資料模型的架構與如何將資料對應(mapping)到 GBIF 最新發展的數據模型。自 2021 年以來，GBIF 透過各研究社群參與、合作，持續開發新數據模型，使數據發布更豐富，支援更複雜類型的生物多樣性數據發布，例如生物遺傳物質訊息。

5 月 30 日上午參加大會開幕及全體會議



### 2. 加州科學院 (California Academy of Sciences, 簡稱 CAS) 參訪(5/29)

加州科學院是一座自然科學博物館，位於金門公園內，主體建築是一座舉世聞名的綠建築，屋頂覆蓋綠色植被，與周遭的環境自然融合，入口處架設太陽能電池，成為入口訪客等候區的遮蔽屋簷。





側邊設進出貨時專用車道與卸貨碼頭，與民眾出入口分離，人車不會互相干擾。



CAS 館內設施豐富，每年吸引超過一百萬人參訪，為所有年齡的旅客提供探索科學的場域，更是親子旅遊的好地方。

有四層樓高的雨林館，自屋頂引入自然光，從自由飛翔的鳥類、蝙蝠、蝴蝶，到兩棲爬行動物，以及豐富多樣熱帶植物，讓參訪遊客親自觀察體驗雨林的生物多样性，並探索學習雨林相關的豐富知識。



展場中各類標本琳琅滿目，標本狀況良好，利用展臺營造出標本與觀眾的安



全距離，又不影響參觀品質。





### 3. 分組學術發表會議(5/31-6/1)

共計 20 個主題，分別在 4 個會議廳舉行，本次大會共計 15 分鐘口頭發表 174 篇，5 分鐘短講口頭發表 27 篇，海報發表計有 31 篇，因應 COVID19 疫情，大會同步推出線上直播，同仁們依據各自有興趣的主題參加。

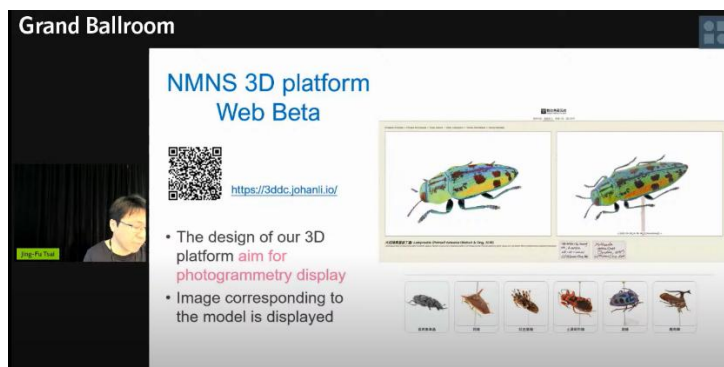
5/31 陳叔倬博士率先報告，題目是「臺灣博物館中族群文物返還差異的現象與評析」。報告完畢之後，鄞啟獻唱熱烈討論與迴響。







5/31 張鈞翔博士報告本館動物蒐藏與對臺灣野生動物保育的經驗與貢獻



蔡經甫博士分享昆蟲影像測量法3D重建與瀏覽平台的應用。



典藏科兩位同仁的演說發表。章晨玫同仁分享文典共構系統在科博館自然史標本及其他文物管理系統的應用。許美蓉同仁分享本館蒐藏庫開箱活動。



黃俞菱博士介紹植物標本蒐藏研究葉片中的植物內生真菌群集與本館館藏之中藥傳說中的真菌



林展蔚博士介紹本館兩爬館藏的研究利用，左為寄生蟲爬蟲宿主之新紀錄，右為蛇類眼睛大小之演化。兩個報告不論在台上或是下台後都收穫很不錯的反饋，亦與數位會與者在結束後互相交流，也讓其他博物館了解本館如何利用我們的兩爬蒐藏。

#### 4. 加州大學柏克萊分校博物館蒐藏庫及植物園 (Berkeley Natural History Museum & Botanical Garden) 參訪 (6/2)



加州大學柏克萊分校博物館蒐藏庫及植物園(Berkeley Natural History Museum & Botanical Garden)，簡稱 BNHM，蒐藏類群包含古生物學、植物學、昆蟲學、脊椎動物學和人類學等，蒐藏數量超過 1 千 5 百萬件。





昆蟲學（埃西格博物館）



植物園種植世界各地植物，包含亞洲、澳洲、加洲、沙漠、地中海、東北美、中南美、南非等區域植物，另外也有主題式植物園，如中草藥、藥草園、玫瑰園等，其中也有來自臺灣的植物，如台灣秋海棠、羽葉藻。



*Begonia formosana*  
台灣秋海棠



*Ellisiophyllum Pinnatum*  
羽葉藻

## 五、心得與建議事項

1. 本館從零蒐藏開始，經過 37 年的積累，蒐藏量已逾 160 萬件，為使本館豐富的蒐藏品以及相關資訊被看見，讓國內外學者、民眾更容易使用，並且使蒐藏品的管理更有效率，自 109 年起與文化部合作，展開 3 年期的藏品管理系統更新計畫，同年在教育部中程計畫與國發會國立社教機構環境優化服務躍升計畫經費挹注之下，著手進行蒐藏庫門禁監控系統與環境監測系統之更新，以及建置極早期火災預警系統，提昇蒐藏品保存環境的安全。藉由本次出國參訪及論文發表，在大會中分享本館在自然史標本與文物管理系統發展的實務經驗，使國際與會人員實際認識本館，同時吸取來自各地與會分享者的寶貴經驗、問題處理方式及掌握國際趨勢，成為本館日後研擬典藏管理策略之參考。
2. SPNHC 年會議程內容豐富多樣，涵蓋自然史蒐藏相關研究、保存維護、數位化、3D 影像、典藏管理與實踐、新科技的應用、安全與監控等各面向議題，很適合館內同仁多加瞭解與接觸。
3. 藏品資訊數位化是國際間發展已久的趨勢，透過國際組織如 GBIF、TDWG 等建立標準，讓生物多樣性資訊能有效傳播與分享。
4. 即使在過去 3 年因 COVID19 疫情帶來全球各種實體學術交流中斷，身為全球生物多樣性資料標準化與公開化重要推手的 GBIF 仍不斷更新優化他們的資料模型，從工作坊的主要講師，也是 DwC 資料專家的 Mr. Wiczorek 教授的內容可知，兩年多來團隊資訊專家與全世界各地區節點的經理、資料專家和使用者，透過線上研討會議方式交流，在 GBIF 秘書處的資訊部門的全力支持下，聯合許多 IPT 工具的使用者與教學者，透過各種個案研究(case study)，制訂新的資料模式框架。身為一個僅具基本認知、沒有 IPT 操作的實務經驗的學員而言，3 個半小時的工作坊真的十分緊湊，有許多課程內容需要消化釐清。但身為博物館研究人員，在參與這個新的資料模型訓練課程後，得知未來 eDNA barcoding、組織樣本這些與自身蒐藏研究相關的資料內容都將被納入新的資料模型中，覺得非常期待。GBIF 也預告在這次工作坊後，未來 6 個月可望將這個新資料模型建構得更完備，屆時會有更完整的補充型的研討會召開，也應該會是自然史博物館人員引頸期盼的增能課程。



5. 身為自然史博物館的研究人員，當然了解博物館蒐藏的重要性，但是研究人員所受到的訓練，多以如何使用標本或是如何進行科學研究為主，有關蒐藏管理相關的知識，多從實務經驗上獲得，這段時間在標本管理以及資料數位化上，都有一定的成果與經驗的累積，但是能透過 SPNHC2023 會議，與世界各國的標本管理者們交流，學習了解其他標本館是如何進行標本數位化，以及如何解決標本管理常碰到的蟲害或其他問題等，是非常珍貴的經驗。
6. 本館為國內蒐藏最豐富的自然史博物館，然而蒐藏管理無論在硬體或軟體上皆有因老舊而不符現代規格的情形，亟需參考國外各大自然史博物館或標本館的經驗，進行更新改造。本次研討會中，有很大的一部份在探討標本數位化以及資料開放的相關成果與問題，本館目前標本數位化比例不高，可以向外界取經學習。
7. 在蒐藏管理系統方面，本館近年將老舊的蒐藏管理與典藏管理系統移植到文化部文物典藏系統，是為蒐藏管理現代化的第一步，但仍有許多問題待改善，這次發現國外的標本數位化流程與本館的作業流程不太相同，他館也是基於人力與經費有限的考量下做出應變，本館應就蒐藏管理與數位化進行流程更新，以解決人力簡化以及經費不足的情形，隨著網路資訊技術的進步，相信結合科技與大眾的力量，應可以幫助我們解決部分人力短缺的問題。然而經費方面仍需要政府方面多加支持，以達到自然史蒐藏管理永續發展的可能性，自然史蒐藏是公共財，無論在保育、教育與研究上都有很大的應用價值，是人類非常重要的共同資產，而將這些珍貴的資產妥善地管理保存，是自然史博物館最重要的使命。
8. 尊重和促進文化多樣性：博物館應該尊重並展示原住民的文化、傳統和價值觀。這可以通過展示原住民藝術、手工藝品、歷史文物和口述歷史等方式實現。博物館應該尋求與當地原住民社群合作，徵求他們的意見和參與，確保展示的內容準確、尊重和具有代表性。
9. 擴大合作夥伴關係：博物館可以與當地原住民社群建立合作夥伴關係，共同開展展覽、教育項目和研究活動。這種合作可以確保原住民的聲音被聽到，並在博物館中得到適當的展示和解釋。透過與當地社區的密切合作，博物館可以更好地了解原住民的需求和期望，並創造出更具包容性和多元化的展示空間。

10. 建立共同編制的展示：博物館可以邀請原住民社群的代表參與展覽的編制過程，包括展覽的主題、內容和敘述方式。這種共同編制的過程可以確保原住民的視角和故事得到適當的呈現，並消除對原住民文化的歧視或刻板印象。同時，博物館應提供有關展覽的背景信息，幫助觀眾更好地理解原住民文化的深度和多樣性。
11. 提供教育和互動活動：博物館應該設計專門針對原住民社群和公眾的教育項目和互動活動。這些活動可以包括原住民的工藝示範、傳統技能工作坊、傳統故事講述、音樂和舞蹈表演等。通過這些活動，博物館可以增進觀眾對原住民文化的理解和尊重，同時提供機會讓原住民社群成員分享他們的知識和技能。
12. 建立反思機制：博物館應該建立一個反思機制，定期評估和反思自己的展示和教育實踐。這包括聆聽來自原住民社群的反饋和建議，並根據需要進行調整和改進。這種反思機制可以確保博物館持續致力於增進原住民參與和尊重原住民文化。
13. 增進原住民在博物館中的參與需要建立合作夥伴關係、尊重文化多樣性、提供教育和互動活動，並建立反思機制。這樣可以確保原住民的聲音被聽到，其文化得到適當的展示和尊重，同時促進公眾對原住民文化的理解和欣賞。

## 綜合心得

我們是誰？及我們在博物館做甚麼事？是參與這場會議最大的收穫。博物館的 curators 是地球故事的說書人，也是標本的保管者。標本的內在價值是發現的過程及研究的故事。透過標本展示地球和生命如何隨時間的推移而發生變化，是自然史的精髓。

但我們如何把故事說得精采？如何推廣讓更多人欣賞？甚至參與？這就是我們為何要參與會議的目的。SPNHC 的會議本質完全符合全球博物館機構及大學型博物館實務需求，透過國際之間蒐藏經理、標本管理者、研究人員的交流，在實作中解決問題、分享及傳承經驗。在臺灣並沒有研究人員在取得學位後就知道怎麼勝任蒐藏經理管理標本的工作，若非在博物館長期接觸館藏或之前未曾沈浸在自然史博物館研究標本，都需要花很長的時間摸索。因此難得有與自然史保

存相關的國際組織，減少摸索時間，直接學習。善用蒐藏及永續利用是博物館的使命，藏品透過反覆不斷地研究與詮釋，才能鑑古知今思未來，進而傳承與共享自然史標本與人類文物的跡證。實體蒐藏及標本數位近用做起來，博物館方能在展示、教育推廣上永續經營，也才能發揮標本最大的價值。

從分類學研究、大數據資料分析、到保育策略，都得回到實體標本所帶有的資訊，而數位化是每個博物館正積極發展的事，也是眼前最大的挑戰，如何在有限的人力與經費下，有策略地將實體標本做到最大的數位近用，並走向開放資料的方向，這需借助國內外長期穩定建立資料庫的經驗，建立可行的工作流程，及資料建置人力，也需有一群資料及資料管理背景的專業人力支援。關於標本的維護，也需透過穩定的環境溫濕設備、先進的櫥櫃、害蟲監控才能延長標本的壽命。本館已邁向第 37 年，空間已開始明顯不足，空調硬體老舊也正面臨汰換，眼前有許多刻不容緩的挑戰，借此會議交流機會，看看別人怎麼做，尋求改善計畫。