The Reopening of the Hyogo Herbarium (HYO) and the Relocation of the Vascular Plant Specimens After Construction of the New Building

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Abstract

The new collection building named Collectionarium*[1] (CN) of the Museum of Nature and Human Activities, Hyogo, (HYO), Hitohaku*[2] Japan, which opened in October 2022, contains ca. 600,000 vascular plant specimens, including 10% that were not mounted. Here, we describe the process of specimen moving to the CN, including integration with ca. 250,000 herbarium specimens of Shoei Junior College (known as SHO). At the same time, the collection sequence has been updated from the new Engler system (Melchior 1964) to the Angiosperm Phylogeny Group (APG) III system. The storage rooms of natural history museums are full everywhere across the world, and extensions are necessary. When collections spaces are enlarged, it creates opportunities to relocate specimens. We hope that our experiences will be useful to other institutions.

The Status of the HYO Collection in 2020

When the construction of the CN started in early 2020, we had 600,000 plant specimens: ca. 350,000 on 220 shelves and the other 250,000 in ca. 1,500 cardboard boxes. The 250,000 specimens, donated by the SHO in 2012, were kept in boxes as existing shelves were too short to house them. Based on an estimated capacity of 1,000–2,000 specimens per shelf, the new storage consisting of 525 shelves would not have the capacity to store all the specimens. Therefore, it was necessary to estimate the total volume of specimens more accurately. The classification system also needed updating.

Change From Engler to APG

At the time of its opening in 1992, HYO specimens were arranged according to the new Engler system. However, the APG system began to be adopted more recently. The new Engler and APG systems are quite distinct, treating dicots in a different way, and some families have disappeared and new ones arisen. The plant picture books published recently in Japan all adopt the APG system. The younger generation studying plants

never learned the new Engler system, making it impossible for them to find specimens arranged in this way. Therefore, we decided to change the arrangement of the specimens to the APG III system whilst relocating the herbarium. For pteridophytes, we decided to adopt the Pteridophyte Phylogeny Group (PPG) I system (PPG I 2016).

In order to plan the placement of specimens, it was necessary to know the number of specimens at the genus level and to investigate how much space each family would need. We measured the thickness of all genus covers containing specimens, regardless of whether they were in shelves or boxes. Based on these results, we planned the layout.

Next we packed the specimens into cardboard boxes following the APG system, and two surfaces of each box was labeled with the room number (=1 or 2) in the CN with locations in the room. All the boxes were moved to the Holonpia Hall (the Hall) from December 2021 to January 2022. Then, 220 empty specimen shelves were transported to the CN in February 2022. After the shelves were moved, ca. 4,000 boxes stored in the Hall were carried back into old repository in March 2022 to wait for moving.

Moving to the new storage

Gases, e.g., ammonia, are released from concrete buildings for a while after construction. Since these gases are harmful to specimens, it is necessary to wait until the gas concentration decreases to a safe level, before storing the specimens there. Beginning in April 2022, the ammonia concentration was measured once a month in the two new storage rooms at the CN. Rooms were ventilated nearly every day. In November 2022, the concentration of ammonia in both rooms fell to 30 ppb or less and it was finally safe to move the specimens in. Moving was carried out during the regular maintenance closure in January 2023.

First, we carried the boxes to the exhibition area on the first floor of the CN because we needed enough space for unpacking and sorting. We opened boxes one by one for each family to combine the HYO and SHO specimens, sorted them in alphabetical order, re-packed them into boxes, brought the boxes up to the storage rooms on the second floor, and placed them onto the shelves.

Two teams of people, three or four for each storage room, worked with this system for six days until all the specimens were placed, properly arranged, and on the shelves by late January. Specimens are now arranged according to the APG system, and ready to be examined. Please contact the authors for herbarium study requests.

Keywords

collection moving, Engler system, APG system

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Conflicts of interest

The authors have declared that no competing interests exist.

References

- Melchior H (1964) A. Engler's Syllabus der Pflanzanfamilien. 12th. Gerbruder Borntraeger, Berlin .
- PPG I (2016) A community-derived classification for extant lycophytes and ferns. Journal of Systematics and Evolution 54 (6): 563-603. [In English]. https://doi.org/10.1111/jse.12229

Endnotes

*1 https://www.hitohaku.jp/infomation/event/30th-ceremony.html

*2 https://www.hitohaku.jp/