Estimates of the number of mounted pteridophyte specimens in six major herbaria in the United States

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Moran, R. C. (The New York Botanical Garden, Bronx, NY 10458-5126, U.S.A.). Estimates of the number of mounted pteridophyte specimens in six major herbaria in the United States. Brittonia 53: 435–436. 2001.—A stratified-random sampling method was used to estimate the number of pteridophyte specimens in six of the largest herbaria in the United States (F, GH/A/NEBC, MO, NY, UC, US). The point estimate of the collection size and the 95% confidence intervals for each herbarium were found to be as follows: US 251,000 (±20,000); NY 201,000 (± 20,000); MO 160,000 (±15,000); GH/A/NEBC 124,000 (±12,000); UC 119,000 (±9,000); F 97,000 (±10,000). It is hoped that these numbers will help assess the growth of these collections in the future.

Key words: collections, herbaria, pteridophytes, taxonomy.

Much of systematic botany is ultimately based on specimens housed in herbaria. Consequently, the number of specimens in herbaria, particularly at larger institutions, is of interest to systematic botanists. *Index Herbariorum* (Holmgren et al., 1990) cites the number of specimens in each of the world's herbaria based on estimates received from the curators of those herbaria; however, it does not cite numbers for particular taxonomic groups such as the pteridophytes, bryophytes, or algae. The purpose of this paper is to estimate using the same sampling method the number of mounted pteridophyte specimens in six of the largest herbaria in the United States: F, GH/A/NEBC, MO, NY, UC, US.

Methods

The six herbaria were sampled on the following dates: F, 30 December 1998; GH/A/NEBC, 18 October 1999; MO, 8 October 1998; NY, 20 September 1998; UC, 20–23 October 1998; US, 12 July 1999. At each herbarium the total number of cubbyholes in the pteridophyte collection was determined by counting the number of cases and multiplying this by the number of cubbyholes per case. Then 120 cubbyholes were selected using a random-numbers table. A stratified-random sampling procedure was used in which the 120 cubbyholes were divided equally among the various aisles or compactor faces. For example, if a herbarium had 10 compactor faces (or aisles) of pteridophytes, then 12 cubbyholes would be selected along each of the 10 faces for a total of 120 cubbyholes. To select the cubbyholes along an aisle or compactor face, random numbers were used to select the cases and the particular cubbyholes to be sampled within those cases. All the specimens in the cubbyhole were counted, including descriptions, photographs, or illustrations, as long as they were mounted on sheets. Boxes of rhizomes were not included in the sample. If a cubbyhole was empty because its specimens were on loan (this happened infrequently), then another cubbyhole in the same case was randomly selected for sampling. The mean and 95% confidence intervals of the sample were calculated using the statistical functions in Microsoft *Excel*. These numbers were multiplied by the total number of cubbyholes in the collection to get the point estimate and upper and lower confidence limits.

Results

The mean number of specimens per cubbyhole was as follows: F 33, GH/A/NEBC

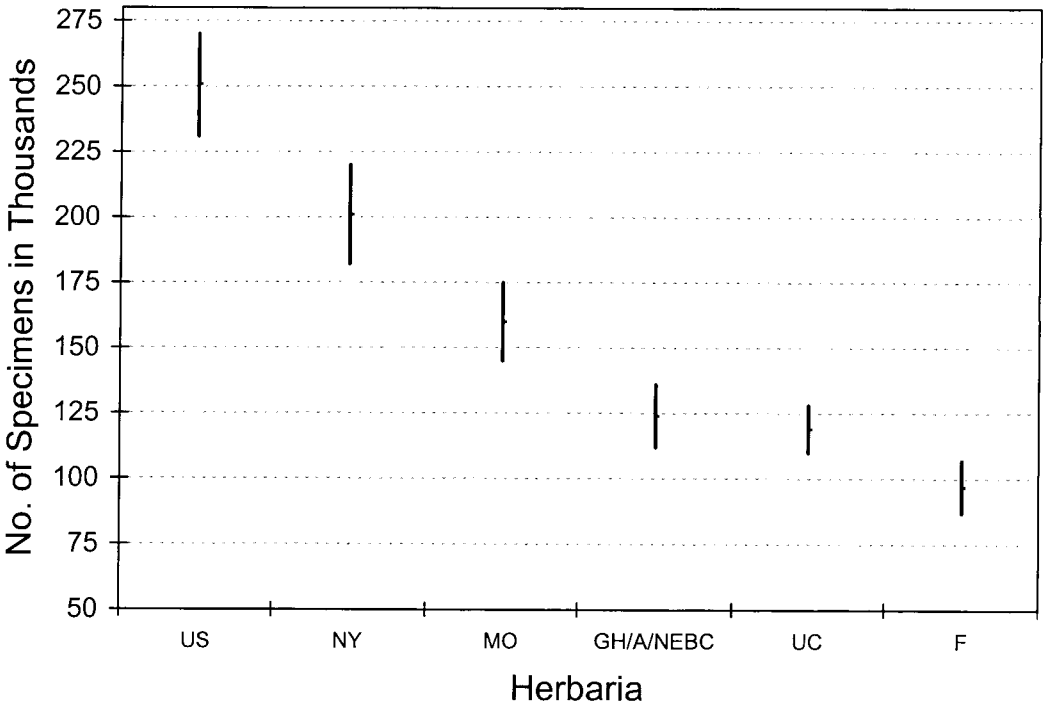

FIG. 1. Estimates of the number of pteridophyte specimens in six major herbaria in the United States.

63, MO 34, NY 50; UC 53; US 69. The point estimate of collection size (i.e., the mean number of specimens per cubbyhole multiplied by the total number of cubbyholes in the entire collection) and the 95% confidence intervals for each herbarium are as follows: US 251,000 (±20,000); NY 201,000 (±20,000); MO 160,000 (±15,000); GH/A/NEBC 124,000 (±12,000); UC 119,000 (±9,000); F 97,000 (±10,000) (Fig. 1).

Discussion

The pteridophyte collection at US is the largest in the United States, primarily because that institution has employed pteridologists continuously for more than a century: William R. Maxon was curator from 1899 to 1946, Conrad V. Morton from 1946 to 1972, David B. Lellinger from 1972 to the present. The next largest collection, at NY, has benefited from the activities of Lucien M. Underwood, curator from 1896 to 1907, and John T. Mickel, curator from 1969 to present. Similarly, UC has benefited from the activities of Edwin B. Copeland, curator from 1928 to 1958, and Alan R. Smith, curator from 1969 to the present. The curators at these institutions have added specimens to their herbaria not only by collecting in the field but also by receiving gift specimens for identification.

The pteridophyte collection at MO appears to be the fastest growing. In 1992, while working at MO as an Assistant Curator, I estimated the size of the collection at about 125,000 specimens. It now stands at about 160,000. The increase has largely come from the tremendous collecting activity of that organization and because of the increased effort in the 1990s to mount its large backlog of specimens.

It is hoped that the estimates given here will help assess the growth of these collections, which might be of historical interest to future pteridologists and curators.

Literature Cited

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