

The Canadian Field-Naturalist

Book Reviews

Book Review Editor's Note: The Canadian Field-Naturalist is a peer-reviewed scientific journal publishing papers on ecology, behaviour, taxonomy, conservation, and other topics relevant to Canadian natural history. In line with this mandate, we review books with a Canadian connection, including those on any species (native or non-native) that inhabits Canada, as well as books covering topics of global relevance, including climate change, biodiversity, species extinction, habitat loss, evolution, and field research experiences.

Currency Codes: CAD Canadian Dollars, USD United States Dollars, EUR Euros, AUD Australian Dollars, GBP British Pounds.

BOTANY

A Conspectus of the North American Isoetaceae

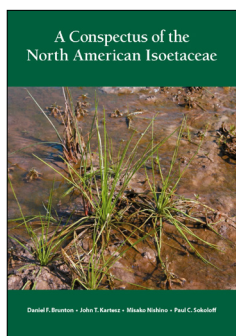
By Daniel F. Brunton, John T. Kartesz, Misako Nishino, and Paul C. Sokoloff. 2025. BRIT Press. 120 pages, 55.00 USD, Paper, 35.00 USD, E-book.

Designed for use by field botanists for identifying *Isoetes* taxa (Isoetaceae; Lycopodiopsida; quillworts), this book is a guide to one of the least studied and least collected taxonomic groups in North America.

The brief introduction provides background on these grass-like, evergreen perennials with notes on endemism, diversity, sterile hybrids, and phytogeography (pp. 1–15). This section also houses the dichotomous key and an explanation on the methodology the authors employed, which includes the use of a scanning electron microscope (SEM).

The Key to North American *Isoetes* focusses on the following: location; leaf colour, width, and habit; plant size; habitat and substrate; megaspore size (~0.4–0.8 mm) and ornamentation; and sporangium velum coverage percentage (pp. 8–11). Microspore characteristics are not included in the dichotomous key as they require SEM imaging. The descriptions of critical features are based on the authors' extensive collective experience and their visual inspections of over 4000 herbarium vouchers as well as SEM images produced at the Canadian Museum of Nature between 2019 and 2024.

Those less versed in botanical dichotomous keys will want to have a resource handy to translate some



terms, especially those related to megaspore texture (which is an important component of identification) such as echinate (prickly or spiny), rugulate (wrinkly), reticulate (net-veined), and cristate (with a terminal tuft or crest). There is a useful diagram (Figure 4) for *Isoetes* megaspore-specific structures, but the line drawing (Figure 5) for the sporangium and related structures of a basal leaf is far less helpful, especially given the importance of the percent of sporangium velum coverage in the key. As velum photos are absent from all but one of the taxa entries, I had to refer to several other sources to understand what the range of velum coverage values would look like in practice.

There are 44 alphabetically organized taxa entries, and each spans two facing pages and includes references for the scientific name and type materials, synonyms, key points, distribution map(s), SEM images of macro and microspores (with scale), and typically one specimen and one habitat photo.

The specimen-based distribution maps are based on herbarium data (compiled by author M. Nishino), and voucher specimens have been verified in many cases. Unfortunately, the maps are not well designed for colour vision deficiency. For green-blind (deuteranopia), red-blind (protanopia), and monochromacy (achromatopsia) vision the 'native to North America' default orange (which for most taxa covers most of the continent) is indistinguishable from the 'present in county' green. As the authors indicate that similar maps are available from The Biota of North America

Program (BONAP; <http://bonap.org/>), I looked there also; the BONAP maps have the same problem but with different categories. For the roughly one in 12 people affected by colour vision deficiency, this will limit the utility of the distribution maps.

The authors state in their introduction that while the traditional determination of spore size and surface ornamentation at ca. 40–50× magnification via a light microscope will be required to distinguish between some closely related taxa, most taxa

can be confidently identified without going to such lengths, particularly when the plant and spore illustrations and range maps provided here are consulted along with the distinguishing elements of the key. (p. 56)

Given the emphasis on megaspore size and ornamentation in the key, the morphological plasticity described by the authors, and the tendency towards

hybridisation, it seems clear to me that a microscope and associated scale bar would be necessary to use this book in most cases. For the five possible taxa in Nova Scotia, for example, one of the main leads in the key is megaspore size, several are based on megaspore ornamentation, and the single plant specimen photo included for each is insufficient to inspire taxonomic confidence. This is not to say that the book is not useful. While it may not be an exhaustive resource due to the hybridisation, speciation, endemism, and presence of cryptic species in an already taxonomically challenging group, this book is an impressive endeavour, is authored by experts, and represents our current understanding of these taxa. Readers should be aware, however, that they will need a microscope to make use of it.

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