ABSTRACT

Between 1896 and 1904 Eugene P. Bicknell described and named 78 species of Sisyrinchium and its segregate Hydastylus (Iridaceae) in the USA, Canada, and Mexico. Though many of these names are surely synonyms, others perhaps represent populations that are not wholly understood and may merit taxonomic recognition. In the absence of a published treatment that addresses these many names, an enumeration is provided that stabilizes Bicknell's names by documentation of their types and, where needed, by designation of appropriate lectotypes or neotypes. Documentation is given for the types of all species of Sisyrinchium and Hydastylus (Iridaceae) published by E.P. Bicknell. Lectotypes are designated for Sisyrinchium amoenum, S. apiculatum, S. arenicola, S. asheianum, S. atlanticum, S. biforme, S. bushii, S. campestre, S. capillare, S. corymbosum, S. exile, S. flagellum, S. flexile, S. hastile, S. helleri, S. incurustatum, S. intermedium, S. macrocarpon, S. miamiense, S. pruinosum, S. radicatum, S. rosalatum, S. scabrellum, S. scoparium, S. strictum, S. tenellum, S. texanum, S. tracyi, Hydastylus cernuus, H. longipes, and H. rivularis. Neotypes are selected for Sisyrinchium dichotomum, S. membranaceum, and S. solstitiale.

In the 1890s a resident of New York City, Eugene Pintard Bicknell (1859–1925), began to record characteristics and differences he had observed in local populations of Sisyrinchium (Iridaceae). He was unable to reconcile these observed differences with the then-standard treatments of the eastern USA flora and, though he was only an amateur botanist — his professional interests lay primarily in law and finance — he ventured to put forward his observations in a series of minutely detailed articles, mostly in the widely read Bulletin of the Torrey Botanical Club.

Bicknell's first presentation (1896) was a relatively modest inquiry into the number of "kinds" (the term "taxa" was, of course, yet to be coined) of Sisyrinchium to be found in the vicinity of New York City. For a number of years he had observed in Van Cortlandt Park two of these entities that, though similar in structure, were clearly distinct without intergrading forms. Outside the City he found a third entity with even stronger distinguishing characteristics. Though two of the three names he created or applied were incorrect (Ward 1968), he nevertheless brought into focus the characters that have well served to distinguish these three species. [By modern usage, Bicknell's plants are S. atlanticum Bicknell, S. angustifolium Miller (= S. graminoides Bicknell), and S. montanum Greene (= S. angustifolium Miller, sensu Bicknell).]

Bicknell, then convinced (May 1899) that Sisyrinchium was an "extensive group of species," undertook a detailed survey of the genus. He attempted to be comprehensive in the USA and Canada, though he gave only limited attention to Mexico. He did this by borrowing the holdings of both individuals and major institutions (apparently, though he was a private citizen, through the auspices of the New York Botanical Garden, whose director, N.L. Britton, had interest in his work), and by developing a widespread network of collectors, which enabled him to build an herbarium of his own. [Bicknell's private collection was given to NY by his widow in 1925.] After what must have been an intensive two years of compilation and study, he began publication of a series of papers, again in the Bulletin of the Torrey Botanical Club. Within the calendar year 1899 he released six papers, totaling
63 pages and reporting 41 new species. He continued this frenetic pace into 1900 with two papers, one documenting the Canadian species, the other reporting an additional 12 species in the segregate *Hydastylus*, which Bicknell recognized at generic level. Still other new species appeared in 1901, 1903, and 1904. Bicknell's preparation of *Sisyrinchium* in Small's compendious *Flora of the Southeastern United States* (1903) was significant in that only there did he present a key that summarized the differences he believed diagnostic in separating the southeastern species.

In total, Bicknell was responsible for publication of 69 species (and one variety) of *Sisyrinchium* and 9 species of *Hydastylus*. Stability of nomenclature of these perplexing plants will not be reached until a linkage is established between these names and the representative specimens of their natural populations.

Bicknell's contributions to understanding of the genus *Sisyrinchium* were not universally appreciated. A contemporary, the plant anatomist T. Holm, grumpily commented (1908) that he wished to present his own data "before the genus *Sisyrinchium* becomes entirely lost in segregates and in new species, which in late years have accumulated very rapidly ... ." Although Small retained Bicknell's treatment of the genus in the second edition of his *Flora of the Southeastern United States* (1913), in Small's later, better known *Manual of the Southeastern Flora* (1933), E.J. Alexander severely edited Bicknell's earlier text, not only deleting many of his species but even omitting mention of them in synonymy.

Bicknell's practice was to cite several, in many cases surely all, of the herbarium materials available to him. These citations generally permit a modern worker to locate the specimen referred to, though the intervening century has seen the dissolution and/or merger of some herbaria or even their destruction (Biltmore, North Carolina). Often Bicknell would note one of the cited collections to be his type, and often he would write "type" on the appropriate sheet (though at times he placed "type" on more than a single sheet of the same collection). Yet all too frequently he made no designation, leaving a later worker to puzzle which of the surviving sheets best fits the diagnosis and be considered the type.

The number of new names in Bicknell's *Sisyrinchium*, coupled with the often subtle morphological distinctions separating species, and compounded by the author's frequently unclear type documentation, has encouraged floristic writers to suppress his names in synonymy rather than attempt linkage between them and the populations they represent. Two regional studies are exceptional: the excellent treatments of *Sisyrinchium* in the Pacific Northwest (Henderson 1976) and the Rocky Mountains (Cholewa & Henderson 1984, 1985) included selection of lectotypes and has greatly assisted in fixing the meaning of certain Bicknell names. Yet many names remain insecure, perhaps listed in synonymy (e.g., Cholewa & Henderson 2002) but with no type formally assigned.

Two unpublished studies merit attention. The first, O'Connell (1955), though his preliminary studies encompassed much of the genus, included in his thesis only those species characterized by unbranched stems. The second, Hornberger (1987), borrowed and annotated a comprehensive volume of herbarium materials but reported she was limited in her field experience to the state of Arkansas and a single brief trip to Louisiana. Regrettably, both of these persons allowed their very informative theses to remain unpublished. Had their graduate dissertations been put in print, they would have encompassed much of the typification and lectotypification attempted here.

Only 30 of Bicknell's new names are now represented by holotypes. More often, either he did not designate any particular collection to be his "type," or where he did so, more than a single specimen, perhaps in different herbaria, are now known. The modern International Code of Botanical Nomenclature (McNeill et al. 2006) provides a formal process for choosing between competing type specimens, by designation of a lectotype. Where no original materials survive, the Code also
provides for selecting a replacement type, a neotype. In the following tabulation, 44 lectotypes are noted, 31 of them newly designated here. And 3 neotypes are selected, where all materials available to Bicknell are believed to no longer exist. Where lectotypes have previously been designated by others (e.g., Henderson 1976; Cholewa & Henderson 1984, 1985), their actions have been noted. The many lectotypes recorded on herbarium labels and in dissertations (O'Connell 1955; Hornberger 1987), though they have no standing under the Code, have been carefully considered and, whenever possible, retained here.

**Typification**

Entries in the following listing are alphabetical by the epithet. Each provides Bicknell's name, the place and date of its publication, and designation and place of deposit of its type. Where useful, additional notes are appended. It is not believed appropriate in the present format to attempt assignment of all Bicknell names to currently recognized taxa. Judgments differ here and, in the southeastern USA especially, some names may represent populations that are apparent in the field but hidden in synonymy.


*Sisyrinchium apiculatum* E.P. Bicknell in Bull. Torrey Bot. Club 26: 300. Jun 1899. **LECTOTYPE** (designated here): USA. **Michigan.** [Muskegon Co.]: "Muskegon," Jun 1898, Beals n.n. (NY; isolecotype MSC). **NOTE:** NY collection is on 2 sheets, one (319420) marked "Type" by Bicknell, the second (319421) unmarked.


*Sisyrinchium asheianum* E.P. Bicknell in Bull. Torrey Bot. Club 26: 607. Sept 1899. **LECTOTYPE** (designated here): USA. **North Carolina.** [Rowan Co.]: "Wet meadows, Salisbury," 28 Apr 1897, Ashe s.n. (NY; isolecotypes GH, MO, NCU, PH, US). **NOTE:** Hornberger (1987, in ms.) has suggested the GM specimen as lectotype; but the NY specimen was kept by Bicknell. W.W. Ashe's name is not on the NY label (label reads "Biltmore Herbarium 5751") but is in his hand.


**Sisyrinchium brayi** E.P. Bicknell, Bull. Torrey Bot. Club 28: 585. 1901. **HOLOTYPE:** **USA. Texas.** [Galveston Co.]: "Flat coastal prairie, Virginia Point, opposite Galveston," 20 Apr 1899, Bray s.n. (NY). **NOTE:** If considered synonymous with **S. pruinosum**, the latter name was chosen for the combined taxon by R.L. Oliver (in Correll & Johnston, 1970).


**Sisyrinchium canbyi** E.P. Bicknell, Bull. Torrey Bot. Club 28: 588. 1901. **HOLOTYPE:** **USA. Texas.** [Brazoria Co.]: "[West] Columbia," 25 Mar 1900, Canby 238 (NY). **NOTE:** Canby 237 (GH) is of same date and location

**Sisyrinchium capillare** E.P. Bicknell, Bull. Torrey Bot. Club 26: 608. Dec 1899. **LECTOTYPE** (designated here): **USA. South Carolina.** [Aiken Co.]: "Aiken," May 1899, Ashe s.n. (NY-319439). **NOTE:** Bicknell cited 5 collections of the species, all by W.W. Ashe, all in April or May 1899. Label data indicated the 2 from Florida were collected in "flat woods," 13 May, "20 mi. s. Jacksonville" (thus apparently Clay Co.), and 18 May, "14 mi. s.e. Jacksonville" (thus surely St. Johns Co.). In the same month of 1899 Ashe made other collections (including the type designated here) in western South Carolina (Aiken) where the species is frequent and in Georgia. Hornberger (1987, in ms.) has proposed typifying **S. capillare** with the Florida specimen of 13 May. But the species has never again been found in n.e. Florida (incl. Duval, Clay, and St. Johns cos.), and it is unlikely that Ashe could have found it twice in separate Florida locations. The probability is high that Ashe's Florida labels reflect confused data. The type designated here is unambiguous.
**Sisyrinchium carolinianum** E.P. Bicknell, Bull. Torrey Bot. Club 26: 221. May 1899. **HOLOTYPE:** USA. South Carolina. [Anderson Co.]: "Andersonville," 1886, Gibbes s.n. (NY). **NOTE:** name is legitimate; see *S. fibrosum*.


**Sisyrinchium corymbosum** E.P. Bicknell, Bull. Torrey Bot. Club 26: 218. May 1899. **LECTOTYPE** (designated here): USA. Florida. [Duval Co.]: "Pine barrens near Jacksonville," 1 Jun 1894, Curtiss 4584 (US-92713; isolecotypes MO, NY, US). *Syntype:* USA. Alabama, Mobile Co.: "damp grassy banks, Mobile," 5 Apr 1897, Mohr s.n. **NOTE:** The US specimens (two plants on same sheet) are marked "Type" in Bicknell's hand. The NY specimen was marked by Bicknell "part of type but very untypical." Query: Can a type be "untypical"?


**Sisyrinchium eastwoodiae** E.P. Bicknell, Bull. Torrey Bot. Club 31: 385. 1904. **HOLOTYPE:** USA. California. [San Bernadino Co.]: "In meadows, San Bernadino Valley," May 1886, Parish 663 (NY; isotypes BR, MO). **NOTE:** Bicknell (1904) also cited 8 paratypes, from Kern Co. (Greene, in 1889; Eastwood, in 1894), from San Bernadino Co. (Parish, in 1880, 1888, 1889, 1894), and from San Diego Co. (Henshaw, in 1803; Palmer 1875), all now presumed NY.


Sisyrinchium fibrosum  E.P. Bicknell, Small, Fl. S.E. U.S. ed. 1, 298. 1903. Nom. succed.: S. carolinianum Bicknell (1899). Note: Bicknell (in Small 1903) proposed this name as substitute for S. carolinianum Bickn., a presumed later homonym of S. carolinianum Klotzsch ex Klatt (1861). But Klatt was merely citing in synonymy a herbarium name used by Klotzsch; Klatt's name was not validly published, thus poses no impediment to S. carolinianum.


Sisyrinchium flagellum  E.P. Bicknell, Bull. Torrey Bot. Club 26: 226. May 1899. Lectotype (designated here): USA. Florida. [Monroe Co.]: "[Big] Pine Key," pre 1853, Blodgett s.n. (NY). Note: S. flagellum was previously lectotypified (Ward 1999) by a Manatee Co. specimen (Rothrock, NY), in error. The Manatee Co. plant has coarse leaves, in serious conflict with Bicknell's description (0.5-1.5 mm. wide). Art. 9.17(b) permits the correction. If considered synonymous with S. miamiense, the latter name was chosen for the combined taxon by Ward (1976).


Sisyrinchium flexile  E.P. Bicknell, Bull. Torrey Bot. Club 26: 613. Dec 1899. Lectotype (designated here): USA. Mississippi. [Jackson Co.]: "Petit Bois Island," 8 May 1898, Tracy 4469 (NY; isotype US). Note: This typification confirms choice made by Hornberger (1987, in ms.). She termed the NY specimen to be "holotype," but neither specimen was marked as type by Bicknell.


**Sisyrinchium hastile** E.P. Bicknell, Bull. Torrey Bot. Club 26: 297. Jun 1899. **LECTOTYPE** (designated here): **USA. Michigan.** [Wayne Co.]: "Sandy shores of Belle Isle in Detroit River," 2 Jun 1896, Farwell 867 (NY; isolectotypes BLH, GH). **NOTE:** A species of unknown affinities, perhaps of horticultural origin. E.J. Alexander in Gleason (1952) identified it as *S. jucundum* E. Meyer, from S. America.; Voss (1972) observed it did not quite match that species and tentatively referred it to *S. pringlei* Robins. & Greenm. of Mexico. [The plant of horticulture is probably *S. juncifolium* Herb., of Chile (Dress 1976).] Bicknell had noted "spathes in a conjugate pair," a trait of *S. albidum*, a Michigan native. But he also reported "partly free filaments," a trait not found in any native northeast *Sisyrinchium*. Hornberger (1987, in ms.) placed the name in synonymy of both *S. albidum* Raf. (p. 89) and *S. mucronatum* Michx. (p. 179), without comment. Voss and Reznicek (2012) suggested it be referred to *S. capillare* Bickn., a species also with paired spathes (but with wholly-connate filaments), native to the coastal Southeast (Virginia to Georgia).


**Sisyrinchium idahoense** E.P. Bicknell, Bull. Torrey Bot. Club 26: 445. Aug 1899. **LECTOTYPE** (designated by Henderson, Brittonia 28: 175. 1976): **USA. Idaho.** [Nez Perce Co.]: "Valley of Big Potlatch River," 6 Jun 1892, *Sandberg 317*. (US; isolectotype NY). **NOTE:** Of 10 collections cited by Bicknell, none was designated as type. Though Henderson (1976) has stated the US specimen to be the holotype, it is better to consider his designation as lectotype. If considered synonymous with *S. occidentale*, the present name was chosen for the combined taxon by Henderson (1976).


Sisyrinchium longifolium  E.P. Bicknell, Small, Fl. S.E. U.S. ed. 1, 300, 1329. 1903.  **Nom. illeg., non**  
*S. longifolium* Phil. (1895).  **HOLOTYPE:** **USA. Florida.** [Manatee Co.]: "Manatee," 8 May 1900, Tracy 6672 (NY).  **Note:** Second collection from same location (7 May 1900, Tracy 6673) marked by Bicknell as "very unlike type." Hornberger (1986 annot.): Tracy 6672 is *S. atlanticum*, Tracy 6673 is *S. nashii*.

**USA. Texas.** [Culberson Co.]: "On top of Guadaloupe Mountains," Oct 1881, Havard s.n. (US).

(designated here): **USA. Arizona.** [Coconino Co.]: "San Francisco mountain," 18 Aug 1889, Knowlton 34 (NY, not confirmed; US).  Basionym for *Sisyrinchium longipes* (Bicknell) Kearney & Peebles, Wash. Acad. Sci. 29:474. 1939.  **Note:** Type chosen from 5 syntypes cited by Bicknell. A different syntype, Townsend 69 (NDG), from Chihuahua, Mexico, has been proposed by B. Hellenthal (annot. on sheet, Aug 2013).


(selected here): **USA. Florida.** [Jackson Co.]: "4.7 mi. n. of Marianna; many plants observed, all with white perianths," 22 Apr 1987, Godfrey 82351 (FLAS; isoneotype FSU); det. as *S. angustifolium* Mill., by M. Drummond.  **Note:** The holotype (Florida, Jackson Co., Marianna, 20 Apr 1899, Ashe?) is now lost, presumably with destruction of the Biltmore Herbarium, Asheville, NC. Spm. selected here is geographically correct. But Bicknell's description does not fully match any known Florida *Sisyrinchium* (fls. described as "violet-blue," etc.).


Ward: Bicknell's *Sisyrinchium* types

1893, *Palmer 165* (US; isolecotypes MICH, WIS). **Note:** The specimen chosen by Henderson is one of 17 syntypes cited by Bicknell.


*Sisyrinchium scoparium* E.P. Bicknell, Bull. Torrey Bot. Club 26: 224. May 1899. **Holotype:** USA. Georgia. [Richmond Co.]: "Dry sand hills, Augusta," 24 Mar [1899], *Cuthbert* s.n. (NY). **Note:** If considered synonymous with *S. fuscatum*, the latter name was chosen for the combined taxon by Cholewa and Henderson (2002).


*Sisyrinchium scoparium* E.P. Bicknell, Bull. Torrey Bot. Club 26: 227. May 1899. **Lectotype** (designated here): USA. Mississippi. [Harrison Co.]: "Biloxi," 27 Apr 1898, *Baker 1496* (NY). **Note:** Bicknell stated type was in herbarium of Alabama Biol. Survey (present location unknown, perhaps lost by destruction of the Auburn Univ. herbarium, by fire); but his description must have been drawn from the specimen selected here, a duplicate. Bicknell cited one paratype, also from Biloxi: *Tracy* (NY).


**Sisyrinchium solstitiale** E.P. Bicknell, Bull. Torrey Bot. Club 26: 219. May 1899. **NEOTYPE** (selected here): **USA. Florida.** [Lake Co.]: "Dry sandy soil, Eustis," 20 Mar 1894, *Nash 133* (NDG; isoneotypes BH, GH, MIN, MO, NY, US). **NOTE:** The specimen designated as type by Bicknell (Lake Co.: "High pine land, Eustis," 10 Aug 1894, *Nash s.n.*), then in the private herbarium of G.V. Nash, is now lost, presumably in the destruction of the Biltmore Herbarium, Asheville, NC. Hornberger (1987, in ms.) suggested a 1901 collection from Dade Co. (*Small & Nash 272 - NY*) as neotype. However, neotype chosen here is by same collector and location/year as lost original, and is widely distributed. This collection is also the type of *X. xerophyllum* Greene (Mar 1899), thus establishing unequivocal synonymy.


**Sisyrinchium violaceum** E.P. Bicknell, Small, Fl. S.E. U.S. 301, 1329. 1903. **HOLOTYPE**: USA. Florida. "Walton Co.," summer 1885, Curtiss s.n. (NY).

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**LITERATURE CITED**


