

DISCOVERY OF A LEWIS AND CLARK GRASS COLLECTION,
POA SECUNDA (POACEAE) SENSU LATO, AT THE HERBARIUM
OF THE ROYAL BOTANIC GARDENS, KEW

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ABSTRACT

The 2005 discovery of a specimen of *Aira brevifolia* Pursh (= *Poa secunda* J. Presl) at the Royal Botanic Garden Kew (K) collected during the 1804–1806 Lewis and Clark expedition demonstrated that the designated lectotype in the Lewis and Clark Herbarium at the Academy of Natural Sciences in Philadelphia (PH-LC) is a mixture of a June 1806 collection made in Idaho and a late July 1806 collection obtained in Montana. Accordingly, a “second step” lectotypification is proposed for the PH-LC sheet restricting application of *A. brevifolia* to the element Pursh had at hand in London, namely plants collected by Lewis probably near the mouth of Crow Coulee, Chouteau County, Montana, on 28 Jul 1806.

RESUMEN

El descubrimiento en 2005 de un espécimen de *Aira brevifolia* Pursh (= *Poa secunda* J. Presl) en el Royal Botanic Garden Kew (K) colectada durante la expedición de Lewis y Clark en 1804–1806 demostró que el lectotipo designado en el Herbario Lewis and Clark en la Academia de Ciencias Naturales en Filadelfia (PH-LC) es una mezcla de la colección de junio de 1806 hecha en Idaho y una colección de finales de julio de 1806 de Montana. De acuerdo con esto, se propone una lectotipificación “segundo paso” para el pliego PH-LC restringiendo la aplicación de *A. brevifolia* para el elemento que Pursh tuvo a mano en Londres, concretamente plantas colectadas por Lewis probablemente cerca de la boca de Crow Coulee, condado de Chouteau, Montana, el 28 de Julio de 1806.

INTRODUCTION

In September 2005 while visiting the herbarium of the Royal Botanic Gardens at Kew (K), the first author discovered a collection labelled *Aira brevifolia* Pursh (Fig. 1) in a *Deschampsia cespitosa* folder (Merritt et al. 2006). It bears labels and annotations congruent with previously detected Lewis and Clark specimens at K by Ewan (1979) and Moulton (1999), but had not been seen by Ewan, Moulton, or botanists investigating the Lewis and Clark collections examined by Frederick Traugott Pursh (1774–1820) in the preparation of his flora (Pursh 1813). Only about ten or eleven Lewis and Clark specimens were known to be at K (Ewan 1979; Moulton 1999; Reveal et al. 1999; McCourt & Spamer 2004a), these having been obtained indirectly at auction by William J. Hooker (1785–1865) in 1842 (Miller 1970).

RESULTS AND DISCUSSION

Features of the Kew and PH Specimens, and Historical Background

The Kew *Aira brevifolia* collection has four features typical of Lewis and Clark specimens found at K: 1) a label in Pursh’s hand with the locality and the date: “Doubtfull River Missouri plains Jul. 28. 1806” (Fig. 1A), thus indicating a Meriwether Lewis collection; 2) annotations by Aylmer Bourke Lambert (1761–1842),

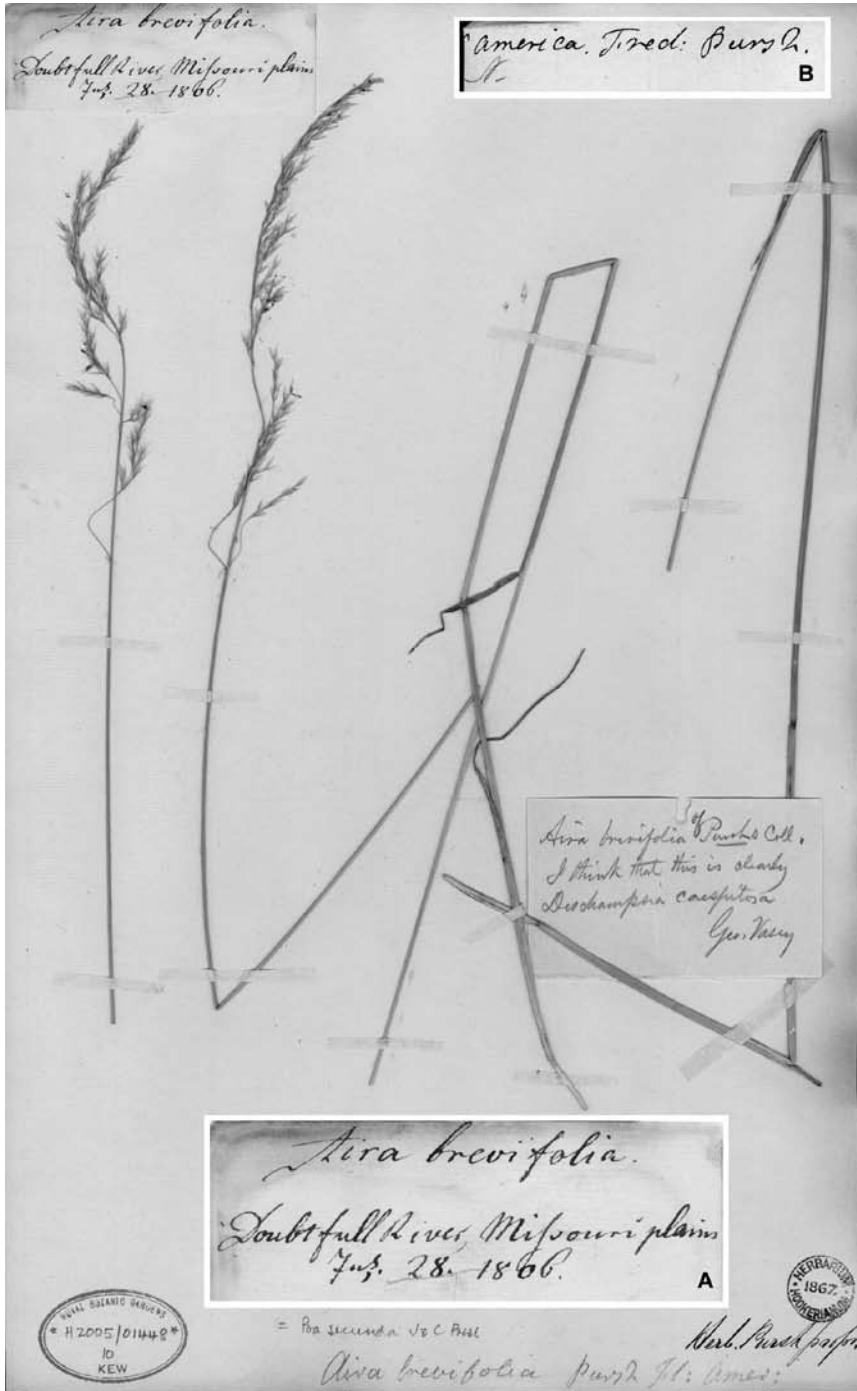


FIG. 1. A collection of *Aira brevifolia* at K, recently discovered to have been collected during the Lewis and Clark expedition. The plant, *Poa secunda* sensu lato, was collected in Chouteau County, Montana, by Meriwether Lewis; A, Pursh's label enlarged; B, annotation of Aylmer Bourke Lambert.

protector and patron of Pursh, one on the front of the sheet: "*Aira brevifolia* Pursh Fl: Amer." and one on the back: "[N.] America Fred. Pursh" (Fig. 1B); 3) an annotation by William Pamphlin (1806–1899), a bookseller and editor: "Herb. Pursh proper"; and 4), an Hb Hooker stamp. An undated annotation by George Vasey (Fig. 1) (1822–1893), an American grass family specialist who identified the specimen as "*Deschampsia caespitosa*" (sic), is one of the reasons why the specimen was filed in *Deschampsia* and not detected previously (Merritt et al. 2006). *Aira* and *Deschampsia* were once considered to be related genera and some of the species were placed in *Aira* by some, and in *Deschampsia* by others (see for example, Hitchcock 1920).

Nevertheless, the collection is correctly identified as the *Poa secunda* J. Presl group (annotated by J. Cayouette and S.J. Darbyshire in 2005). In fact, as the specimen has most of its spikelets shattered, it was not recognized easily as a *Poa* species. The shattered state of the spikelets of the *P. secunda* specimen is congruent with its having been collected late in the season, on July 28, 1806. On that day, a Monday, Lewis and his men were in western Montana near today's Fort Benton. In the morning they were in Chouteau County, close to the Missouri River, after retreating from the Blackfeet Indians for three days (they killed two in the only "battle" of the expedition; see Moulton 1993). They were fatigued but determined to reach the river. When they heard rifle fire, they assumed it was Sergeant Patrick Gass and his party bringing the canoes down river. They reached the Missouri River, still in Chouteau County, and the two groups joined up that afternoon. From near the mouth of the Marias River they journeyed downstream about fifteen miles and camped.

It is difficult to determine exactly where Lewis collected the plant. Also uncertain is the "Doubtful River" reported on the label (Fig. 1A), probably transcribed by Pursh from an annotation by Lewis that is now lost. This location is not mentioned in the journals nor is it shown on Clark's maps, but might refer to the area near the mouth of Crow Coulee (Chouteau County, see Merritt et al. 2006) which would have been a "Doubtful River."

The main Lewis and Clark plant collections are at the herbarium of the Academy of Natural Sciences of Philadelphia (PH-LC) and have been fully documented (Moulton 1999; Reveal et al. 1999; McCourt & Spamer 2004a, b; Spamer & McCourt 2004). When Pursh went to London in 1811, he brought some of Lewis's plants, most probably those he thought were new to science (Reveal et al. 1999; McCourt & Spamer 2004b) to prepare his *Flora Americae Septentrionalis* that was published in late December 1813. The numbers of Lewis and Clark specimens he brought with him are not known but probably there were about 50, representing approximately 25% of the entire Lewis and Clark collection (McCourt & Spamer 2003).

After the publication of his flora, Pursh returned to North America (Canada) and left his specimens with A.B. Lambert who kept them in his personal herbarium in London. After Lambert's death in 1842, his herbarium was auctioned off, with Pursh's specimens placed in at least two lots (Miller 1970; Moulton 1999). The one acquired by the botanist Edward Tuckerman (1817–1886) contained many of Lewis's specimens, and they eventually found their home in Philadelphia along with the other collections stored at the American Philosophical Society that were recovered in 1897. An unknown number of Lewis's plants were mixed with the Pursh herbarium in a lot that was acquired by Pamphlin. The Pursh plants came later to W.J. Hooker and became the property of Kew in 1867 when Hooker's herbarium was purchased by Kew. Joseph Ewan discovered the Lewis specimens at Kew (Ewan 1979).

Most of the ten or eleven collections authoritatively attributed to Lewis are duplicates of specimens retained in Philadelphia and now part of PH-LC. The Philadelphia collections include type species described by Pursh in his flora. Most of the Kew duplicates bear a Pursh label and share the same date and locality, but this is not the case with the PH-LC counterpart of *Aira brevifolia* (Fig. 2). Until recently only one collection from the Lewis and Clark expedition could be associated with *Aira brevifolia*, PH-LC 170. On that sheet the label written by Pursh reads: "The most common grass through the plains of Columbia & near the Kooskoo-see [Clearwater] R. Jun: 10th 1806." Pursh added: "*Poa trivialis* L. var." The name of *Aira brevifolia* was not written by Pursh on the sheet but added by Thomas Meehan (1826–1901, fide Moulton 1999, fig. 133 and transcription of the annotations) probably in 1897. That specimen was reported to have been collected in

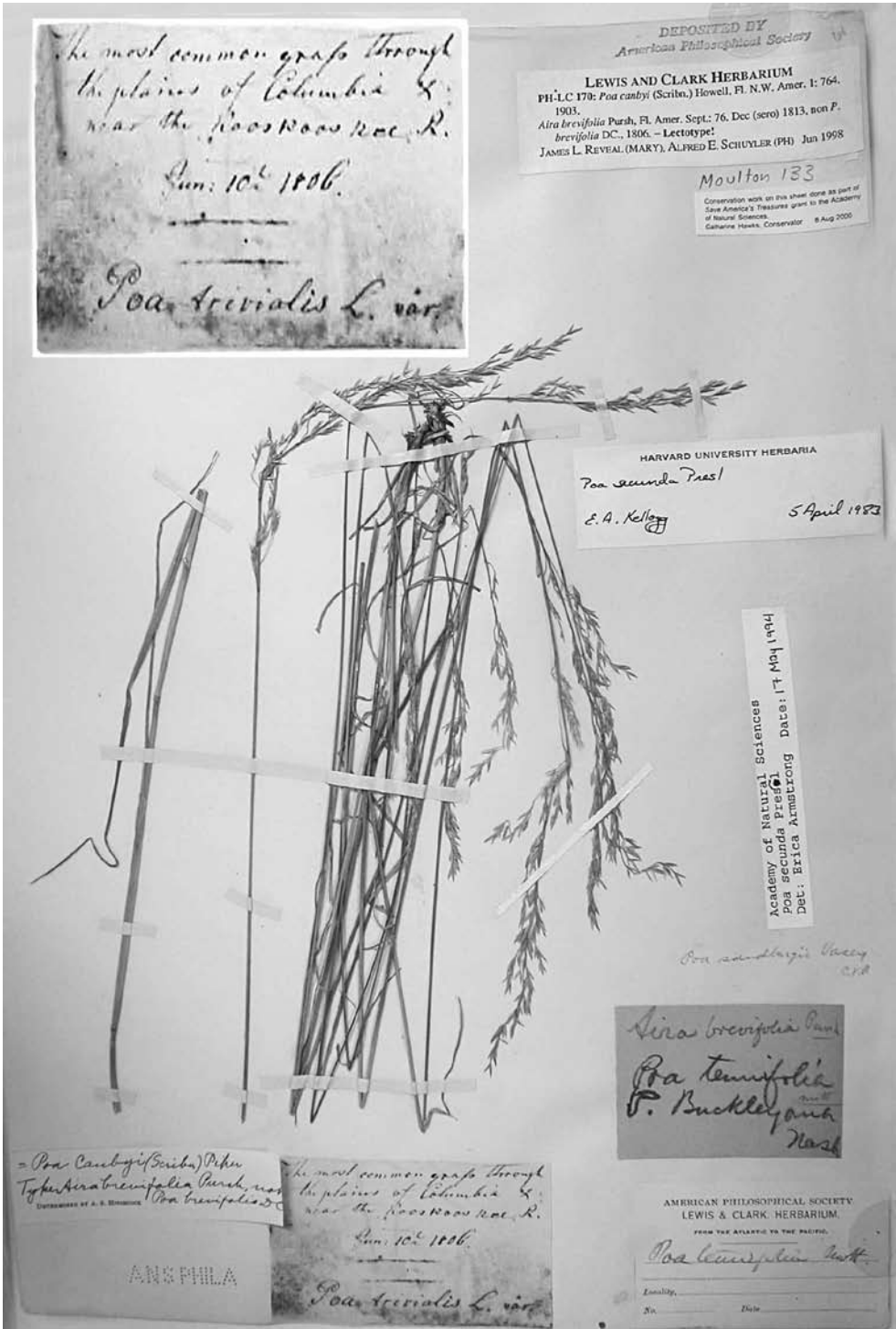


Fig. 2. Lectotype of *Aira brevifolia* Pursh (PH-LC 170) representing *Poa secunda* sensu lato collected in Idaho County, Idaho, by Meriwether Lewis; Pursh's label enlarged at the top left of the sheet.

Idaho County, Idaho (Moulton 1999; Reveal et al. 1999) and was identified as belonging to the *Poa secunda* group (Hitchcock 1935; Cutright 1969; Ewan 1979; Moulton 1999; Reveal et al. 1999; Soreng 2003).

Clarification of the Lectotypification

It seems likely that the PH-LC collection consists of portions of both the Idaho and Montana collections (Fig. 2) for the second left hand specimen (with a bent panicle) most closely resembles the specimens on the K sheet, while the large clump to the right has roots and mature (not shattered) spikelets, and seems to correspond to collections made earlier (June 10). The K panicles, with mostly brown and shattered spikelets, clearly correspond to a later collection (July 28). A fragment of the PH-LC lectotype is present in the US herbarium (US-76299) and was reported in Soreng (2003: 90). A.S. Hitchcock and A. Chase used to obtain fragments of type material of North American grasses and they were deposited in US as reference specimens (Hitchcock 1935). According to R.J. Soreng (pers. comm. 2006), the fragment of the panicle of the US-76299 bears brown spikelets. An examination of the spikelets of the two supposed groups of specimens on the PH-LC sheet did not reveal a difference in color (A.E. Schuyler, pers. comm. 2006). At this time, it is not known from which group of panicles of the PH-LC sheet the panicle fragment at US originated and therefore its type status is in question.

Aira brevifolia Pursh was described from specimens Frederick Pursh obtained from Meriwether Lewis who collected them during the Lewis and Clark expedition of 1804–1806 (Pursh, *Fl. Amer. Sept.*: 76, sero 1813). Following his description, Pursh indicated: “In the plains of Missouri. *M. Lewis*. June, July. v.s. in *Herb. Lewis*. This grass is the most common in those plains.” Unaware of the existence of the K specimen of *Aira brevifolia*, Cutright (1969: 401) selected PH-LC 170 as a lectotype (as “type”) for *Aira brevifolia* and it was considered as such by Reveal et al. (1999: 39).

The PH-LC and the K specimens represent the same taxon, *Poa secunda* J. Presl, so Pursh’s description (protologue) applies to both specimens. It seems evident that Pursh saw the two specimens and transcribed Lewis’ annotations of the labels; this is why June and July appear in the protologue. The PH-LC specimen remained in Philadelphia while the K sheet was brought by Pursh to London in 1811 where he prepared his flora (Moulton 1999). So Pursh had the K specimen before him when he described *Aira brevifolia* but not PH-LC 170. Pursh personally wrote *Aira brevifolia* on the K label (Fig. 1A), and the specimen has fewer and shorter leaves (*brevifolia*) than the PH-LC specimens. Pursh did not inscribe “*Aira brevifolia*” on the PH-LC specimen but rather “*Poa trivialis* L. var.” Clearly, his decision to recognize a new species was made after he left Philadelphia in 1809. While the two collections from Idaho and Montana taxonomically represent the same taxon, PH-LC 170 remains the lectotype of *Aira brevifolia* even if the K specimen would have made a more suitable choice.

Nonetheless, as noted here, the PH-LC sheet is a mixture of two collections, one made in Idaho in June of 1806 and a second obtained in Montana in July of 1806. Although the designation of the PH-LC as the lectotype cannot be altered, it is necessary to restrict application of the name to one of the two discordant elements. Accordingly, we hereby restrict the lectotype to just a portion of the PH-LC specimen and designate here (hoc loc.) as the lectotype the following element: *Lewis s.n.*, “Doubtfull River Missouri plains,” probably near the mouth of Crow Coulee, Chouteau County, Montana, 28 Jul 1806, PH-LC-170, the second left hand specimen with a bent panicle. A duplicate of the lectotype is at K.

CONCLUSION

Numerous grasses were seen by Lewis and Clark in the open areas of the prairie habitats and some were actually collected by Lewis because of their obvious or potential economic importance (Earle & Reveal 2003). It is not clear why Lewis would have collected such a common and widespread grass as Sandberg’s bluegrass (*Poa secunda*), but it probably was because the seeds were readily available, and he needed a voucher specimen to go with the seeds. There might be at least another reason for this collection. By late July 1806 Lewis knew that all of his 1805 plant collections cached in Montana before crossing the Rocky Mountains (save one, a *Ribes*) were lost, and obtaining a grass may have been an attempt to acquire a more diverse col-

lection. Lewis continued to collect, albeit rarely, going down river until he was accidentally wounded on 11 August (Moulton 1993).

As previously recorded, some of the K specimens of the Lewis and Clark expedition are duplicates of the PH-LC ones (Ewan 1979; Moulton 1999; Reveal et al. 1999). Interestingly, according to Moulton (1999), there are seven specimens found at K that have no counterpart at PH-LC. A search for other potential Lewis and Clark authentic specimens has been intensive at these herbaria and elsewhere, and most of the possibilities have been documented, discussed, and resolved (Moulton 1999; Reveal et al. 1999).

On the other hand, despite a careful search at K by Moulton, Ewan and others investigating the Lewis and Clark collections examined by Pursh, a grass collection of *Poa secunda* sensu lato was still there and unrevealed. Is it possible that other Lewis and Clark collections brought by Pursh to London in 1811 are still undetected within the seven million specimens of the K herbarium, one of the largest of its kind in the world? Even if browsing the North American folders at K may represent a monumental task, it may lead to tracing lost or unknown Lewis and Clark specimens. With the eventual data basing of the K herbarium, such a search would be facilitated, but the largest herbaria are likely to be the last ones to have such documentation.

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