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## TYPIFICATION OF *SOLIDAGO RETRORSA* MICHX. (ASTERACEAE: ASTEREA)

**JOHN C. SEMPLE**

Department of Biology, University of Waterloo  
Waterloo, Ontario Canada N2L 3G1  
jcsemp@uwaterloo.ca

**VERONIQUE DURAND-ANDRO, GREGOIRE FLAMENT, AND CECILE AUPIC**

Direction des Collections naturalistes - Botanique, Muséum national d'Histoire naturelle,  
57 rue Cuvier, CP39, 75005 Paris, France

**FLORIAN JABBOUR**

Institut de Systématique, Évolution, Biodiversité (ISYEB)  
Muséum national d'Histoire naturelle, CNRS, Sorbonne Université, EPHE, Université des  
Antilles,  
57 rue Cuvier, CP39, 75005 Paris, France

### ABSTRACT

*Solidago retrorsa* was published by André Michaux in 1803 and placed in synonymy under *S. odora* by Asa Gray (undated annotation). The Michaux herbarium includes five sheets that are likely original material on which typification of the name can be based. One of these collections is selected as the lectotype and two other collections are considered to be possible isolectotypes or syntypes; all are identified as *S. odora*. The fourth and fifth collections treated as *S. odora* are identified as *S. tortifolia*, an unrelated species.

As part of the work being done by the first author to complete a monograph of the entire genus *Solidago* L., numerous small nomenclatural problems have to be resolved. One of these is the identification of possible type material for the name *Solidago retrorsa* Michx. (Fl. Bor. Amer. 2: 117. 1803). With the help of the staff of the Muséum National d'Histoire Naturelle in Paris in locating, identifying, and annotating possible type material for *S. retrorsa*, three collections were found among specimens in the André Michaux collection (P-MICH) and in the general collection that had been labeled as *S. retrorsa* at some point in the past, although none were annotated as type specimens. Each collection is discussed below. Two additional collections were labeled as *S. odora* Ait.

The first herbarium sheet from the André Michaux collection has a label in Michaux's manuscript with the following information "Solidago retrorsa" at the top of the label and "Basse Caroline" "Bois pres l'habitat" [wood near populated area, transl. FJ] on the bottom of the label. The specimen consists of an upper stem with some leaves and a large apically secund conical inflorescence with flowering and fruiting heads. This collection has been identified by the first author as *S. odora* Ait. (Fig. 1).

A second herbarium sheet has two smaller shoots on the sheet and several labels (Fig. 2). The label in the lower left corner of the sheet has in a different manuscript from the first collection "Solidago retrorsa," "Ameriq: Sept." and "Michaux" in ink and "S. odora A.G." in pencil in Asa Gray's distinctive script. The label on the lower right corner is a Mus. Nat. Paris

label with “*Solidago odora* A. (ex Asa Gray!) *S. retrorsa* Michx.” written in ink in Edouard Spach’s handscript. The two shoots are possibly Michaux collections made at the same time as the first collection or at a different time on the same expedition from a different location; there are insufficient data to know for certain. Both shoots on this second herbarium specimen have been identified as *S. odora* by the first author.



Figure 1. Lectotype of *Solidago retrorsa* Michx. Michaux s.n. (P-MICHX). Barcode: P00320362. <<http://coldb.mnhn.fr/catalognumber/mnhn/p/p00320362>>





Figure 2. Possible isolectotype/syntype of *Solidago retrorsa* Michx. Michaux s.n., on left (P). Barcode: P02512809. <<http://coldb.mnhn.fr/catalognumber/mnhn/p/p02512809>>



A third herbarium sheet in P (Fig. 3) has two mid to upper stem shoots with inflorescences and a label with “*Solidago retrorsa*.” and “Michaux” in black ink and “Herbarium Richard” in red ink at the top. The largest mid stem leaf is entire and has a prominent midvein. The inflorescences have long lower branches and bear heads that range from immature to fruiting. The first author identified these shoots as *S. odora*.

A fourth herbarium sheet, stored in the André Michaux collection, consists of four upper shoots (Fig. 4) and bears a label with André Michaux’s handschrift “*Solidago odora* Ait./ *Virga aurea americana*/ *Tarraconis facie et sapore*, --- *panicula copiosissima*/ Pluck Phytogr T.116.f.6.” These shoots are all identified by the first author as *Solidago tortifolia* Ell., having leaf shape and small leaf margin serrations typical of that species, and the larger leaves are triple-nerved as found in *Solidago* subsect. *Triplinerviae* (Torr. & A. Gray) Nesom and not like *S. odora* which has entire single-veined leaves without serrations (Semple & Cook 2006).

A fifth specimen collected by Michaux and kept at P (Drake collection) consists of two upper shoots (Fig. 5) and bears a label “*Solidago odora* Hort Kew” and “Michaux” in black ink and “Herb. Richard” in red ink. These shoots are all identified by the first author as *Solidago tortifolia* Ell., having leaf shape and small leaf margin serrations typical of that species.

The first herbarium sheet (P00320362) with the Michaux handschrift is selected here as the lectotype of *Solidago retrorsa* Michx. The second (P02512809) and third (P02512861) sheets include possible isolectotypes or possible syntypes of *S. retrorsa*. The fourth (P00320365) and fifth (P02512864) herbarium sheets do not contain any type material of *S. retrorsa* because the specimens belong to another *Solidago* species. The name *Solidago retrorsa* belongs in synonymy under *S. odora* Ait., the oldest valid name for the species.

***Solidago retrorsa*** Michx. in *Flora Boreali-Americana* (Michaux) 2: 117. 1803. **LECTOTYPE** (designated here): **USA**. Basse Caroline, Bois pres l’habitat, *A. Michaux s.n.* (P00320362!-Fig. 1; possible isolectotypes/syntypes: P02512809!-Fig. 2, P02512861!-Fig. 3)

*Solidago retrorsa* was listed by Rafinesque (1836) in his protologue of *Solidago* subg. *Triactis* Raf. The protologue was brief: “*Triactis*. Rad. 3-4 brevis cuneatis, flosculis 3-5. Typ. 1 *S. retrorsa* Mx. 2. *tortifolia* E.” Nesom (1993) selected *S. tortifolia* as the lectotype for *Solidago* subg. *Triactis*, but our interpretation is that Rafinesque designated *S. retrorsa*, a synonym of *S. odora*, as the type species. The numbering of all species listed under the various subgenera was consecutive and species listed after other subgenera were not in alphabetical order. Thus, we take the first species listed following “Typ.” as Rafinesque’s type for each subgenus, not the other species designated as lectotypes by Nesom (1993).



Figure 3. Possible isoelectotype/syntype of *Solidago retrorsa* Michx. Michaux s.n. (P). Barcode: P02512861. <<https://science.mnhn.fr/institution/mnhn/collection/p/P02512861>>

**ISOLECTOTYPE:** *Solidago retrorsa* Michx.  
 Fl. Bor. Amer. 2: 117. 1803. TYPE: "HAB. in  
 Carolinae inferiore," Michaux s.n. (Lectotype:  
 "Solidago retrorsa (on top of label)" "Basse  
 Caroline" "Bois pres l'habitat" in Michaux's  
 handscript P!; possible isoelectotype: "Solidago  
 retrorsa / Ameriq: Sept: Michx." annotated by A.  
 Gray "S. odora" P!; "Solidago retrorsa,  
 Michaux" Herb. Richard, P!).  
 = *Solidago odora* Ait.  
 John C. Semple 23 Sep 2020  
 University of Waterloo, WAT

*Solidago retrorsa*  
 Michaux

HERBIER E. DRAKE  
 HERB. MUS. PARIS

Herbier Muséum Paris  
 P02512861





Figure 4. *Solidago odora* collection that is *S. tortifolia*. Michaux s.n. (P-MICHX). Barcode: P00320365. <<https://science.mnhn.fr/institution/mnhn/collection/p/item/P00320365>>





Figure 5. *Solidago odora* collection that is *S. tortifolia*. Michaux s.n. (P). Barcode: P02512864. <https://science.mnhn.fr/institution/mnhn/collection/p/P02512864>



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