Solanum pimpinellifolium – new for the alien flora of Austria, with comments on Austrian records of S. triflorum and S. nitidibaccatum

Sandra Knapp

Department of Life Sciences, Algae, Fungi & Plants Division, Natural History Museum, Cromwell Road, London SW7 5BD, England, U.K.; e-mail: s.knapp@nhm.ac.uk

Abstract: Solanum pimpinellifolium has been found in Vienna in 2012 and is new for the alien flora of Austria. The single Austrian herbarium specimen of Solanum triflorum – collected in Vienna in 1969 – could be confirmed. Characters and native distributions of both species are discussed. Solanum nitidibaccatum has been treated as subspecies of S. physalifolium in the recent Excursion Flora of Austria by Fischer & al. (2008), but is a distinct, well-defined species with different native distribution in South America whereas S. physalifolium is not known outside its native range. All records of S. physalifolium in Austria represent plants of S. nitidibaccatum. Solanum sarrachoides has not been found in Austria yet. The population collected and published by Helmut Melzer as S. sar[r]achoides is in fact S. nitidibaccatum.

Key words: Flora of Vienna; Austria; new records; Solanum; Solanaceae

Zusammenfassung: Solanum pimpinellifolium – neu für die Adventivflora Österreichs, mit Kommentaren zu österreichischen Angaben von S. triflorum und S. nitidibaccatum


Introduction

During a visit to the herbarium of the Natural History Museum Vienna (W) under the auspices of the EU-funded Project SYNTHESYS3, the global collections of Solanum were checked and reviewed. On this occasion, one species of Solanum new for the alien flora of Austria according to Walter & al. (2002) and Fischer & al. (2008) has been found, and another introduced, but rarely collected, species confirmed.

Taxonomy and nomenclature in this publication follows that established on the Solanaceae Source website (www.solanaceaesource.org) and in recent monographic (Peralta & al. 2008) and phylogenetic (Särkinen & al. 2015a) studies.

DOI: https://doi.org/10.5281/zenodo.1196135
Results and Discussion

*Solanum pimpinellifolium*

New for the alien flora of Austria and Vienna. This species (previously known as *Lycopersicon pimpinellifolium*) has a native distribution in western South America, from Ecuador south to Chile, but is also found as alien species in many tropical and temperate countries (Peralta & al. 2008). In Central Europe *S. pimpinellifolium* has not been recorded outside of cultivation in gardens and greenhouses (see Peralta & al. 2008 and Solanaceae Source, www.solanaceasource.org).

As the wild progenitor, *Solanum pimpinellifolium* hybridizes easily with the cultivated tomato *Solanum lycopersicum*. *Solanum pimpinellifolium* is usually called the currant tomato in English or Johannisbeertomate in German, a reference to its small fruits. Specimens can be difficult to identify with 100% accuracy, but in general plants of *S. pimpinellifolium* have the following suite of characters (see Peralta & al. 2008):

- Heart-shaped leaflets
- Entire leaflet margins
- Flower buds more than 2 times as long as wide (very narrow and pointed)
- Elongate inflorescences with more than 30 fruits
- Small berries less than 1 cm in diameter

The key from Peralta & al. (2008) adapted here can be used to distinguish the two taxa (but see below):

1a. Plants pubescent, the longest trichomes to 3 mm; leaflet margins usually dentate especially at the base, often with secondary teeth; inflorescence usually with <12 flowers per branch (except in some cultivars); corolla shallowly stellate and the lobes deltate; fruits >1 cm in diameter. .................. *Solanum lycopersicum*

1b. Plants usually sparsely pubescent or subglabrous (very rarely densely velvety pubescent), the longest trichomes to 1 mm; leaflet margins usually entire or slightly dentate to crenate; inflorescence usually with >12 flowers per branch; corolla deeply stellate and the lobes very narrow; fruits <1 cm in diameter. ... *Solanum pimpinellifolium*

Peralta & al. (2008) suggested as a rule of thumb that possession of 3 of the above 5 characters would place a given plant into *S. pimpinellifolium*, otherwise it should be identified as *S. lycopersicum*. The boundaries between these two closely related taxa are not sharp, but they are maintained as distinct because despite hybridization when growing sympatrically or cultivated together the taxa are under strikingly different selection regimes; *S. pimpinellifolium* is a wild plant under the influence of natural selection and *S. lycopersicum* is only known from cultivation and in association with artificial selection mediated by humans, see Ranil & al. (2017) for discussion of this in the context of the cultivated eggplant, *S. melongena*. 
In Vienna, *S. pimpinellifolium* was found at a ruderal site between residential houses. Garden shops in and around Vienna offer “tomatoes” with small fruits for cultivation. Most probably this occurrence originates from cultivation in a former garden.

**Specimen:**


*Solanum triflorum*

This species has a native range in the Americas, with a classical amphitropical distribution; it is found in southern South America and in North America north of Mexico. *Solanum triflorum* is widespread as an alien species in both Europe and North America, and has also been recorded in Australia (see www.solanaceaesource.org); its native status in the United States and Canada is not certain. In its native range (Barboza & al. 2013), leaf shape and fruit size vary considerably, but berries of this species always have numerous sclerotic granules – small round deposits that look like seeds but are more regular in shape (Bitter 1914, see Figs. 6 & 7).

In Austria, *S. triflorum* was only found in a waste deposit in Vienna in 1969 (Forstner & Hübl 1971), and probably at a biogas plant in Zwentendorf (Lower Austria/Niederösterreich) in 2010 (Bernhardt & al. 2013, no voucher seen). This is astonishing as this species should be able to withstand the climatic conditions of Vienna; in northern New Mexico, where freezing temperatures occur for long periods in the winter, it is common on disturbed ground (SK, pers. obs.). Although not recorded in Adler & Mrkvicka (2003) or Fischer & al. (2008) due to its rarity, it is likely that this species will be found more often in the future in Austria; there are many collections from Central and Western Europe (see www.solanaceaesource.org and Valdés 2012).

The key in Jäger (2017) can be used to distinguish this species from others occurring in Austria; the principal differences between *S. triflorum* and other non-spiny Solanum species in Europe are its deeply to shallowly pinnatifid (although some forms can have almost entire margins), somewhat fleshy leaves, its flowers with very narrow petal lobes and its berries with copious sclerids (stone cells).

**Specimen:**


*Solanum nitidibaccatum*

This species is reduced to subspecies rank within *S. physalifolium* in the current Excursion Flora of Austria (Fischer & al. 2008) following Edmonds (1974). This taxon is a well-defined species similar, but not closely related, to *S. physalifolium* (Särkinen & al. 2015a), which is an endemic of the eastern slopes of the Andes at middle elevations (Särkinen & al. 2015b) in Peru and Bolivia and is not known outside its native range.
In contrast, *S. nitidibaccatum* is found further south and to the west; it is common in Patagonia (Barboza & al. 2013). Thus, all records of *S. physalifolium* from Austria refer to *S. nitidibaccatum*.

*Solanum sarrachoides* is another glandular pubescent species with accrescent calyces that is occasionally (but less commonly than *S. nitidibaccatum*) found as a weed of arable land in Europe. The single record of *S. sarrachoides* from Styria/Steiermark (Melzer & Barta 1997, Walter & al. 2002, as *S. sarachoides*) is in fact *S. nitidibaccatum*, as originally published by Melzer (1976). Thus, *Solanum sarrachoides* has not yet been confirmed for Austria, but is known from United Kingdom, Germany, France and Sweden (SK, pers. obs.). A key for distinguishing the sticky herbaceous solanums with accrescent calyces can be found in Särkinen & Knapp (2016).

Specimen:

**Stiermark:** Muralt, in einer aufgelassenen Kiesgrube zwischen Lind und Zooweg auf Ablagerung drei große Exemplare; (8854/2); [ca. 650 msm]; 11. September und November 1975: Helmut Melzer (LI 688497, LI 860096); ref. (on digital image) S. Knapp (16 September 2017).

**Acknowledgment**

The visit in the Natural History Museum Vienna (W) was supported by the European project SYNTHESYS (http://www.synthesys.info/), financed by European Community Research Infrastructure Action under the FP7 Integrating Activities Programme. I thank the curators of LI and W, C. Gilli for providing images of *S. nitidibaccatum* specimens from LI, and C. Pachschwöll for editorial and logistic assistance.

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1 June 2017].

Received 31 May 2017
Revision received 11 August 2017
Accepted 16 September 2017