

***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*
Solanum pimpinellifolium wurde 2012 in Wien gefunden und ist neu für die Adventivflora Österreichs. Der einzige österreichische Herbarbeleg von *Solanum triflorum* – gesammelt 1969 in Wien – konnte bestätigt werden. Merkmale und natürliche Verbreitung beider Arten werden diskutiert. *Solanum nitidibaccatum* wird in der aktuellen Exkursionsflora von Österreich (FISCHER & al. 2008) als Unterart von *S. physalifolium* geführt. *Solanum nitidibaccatum* ist aber eine eigene, klar geschiedene Art mit anderer Verbreitung in Südamerika, wohingegen *S. physalifolium* nicht außerhalb ihres natürlichen Verbreitungsareals vorkommt. Alle Angaben von *S. physalifolium* aus Österreich sind zu *S. nitidibaccatum* zu stellen. *Solanum sarrachoides* ist für die Adventivflora Österreichs zu streichen, da die von Helmut Melzer gesammelte und publizierte Population *S. nitidibaccatum* darstellt.

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.

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.solanaceaesource.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:

W i e n : 14. Bezirk, knapp S der Schleusenstraße in Hadersdorf, 48°12'38" N, 16°13'43" E [exactness 100 m]; 7763/3; 220–230 msm; Ödland (ehemaliges Gartengelände), anscheinend verwildert; 3. Oktober 2012: Thomas Barta ([W 2013-0003476](#), [W 2013-0003477](#)).

Solanum triflorum

This species has a native range in the Americas, with a classical amphotropical 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:

W i e n : 10. Bezirk, Müllplatz Laaerberg; 7864/1; [ca. 230 msm]; planierte Stelle, ein einzelnes Exemplar; 1. September 1969: Walter Forstner & Helmut Melzer ([W 1970-0010263](#)).

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:

Steiermark: Murtal, in einer aufgelassenen Kiesgrube zwischen Lind und Zeltweg auf Ablagerungen 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 SYNTHESIS3 (<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.

References

- ADLER W. & MRKVICKA A. C. (2003): Die Flora Wiens gestern und heute. – Wien: Verlag des Naturhistorischen Museums Wien.
- BARBOZA G. E., KNAPP S. & SÄRKINEN T. E. (2013): Grupo VII. Moreloide. – In: ANTON A.M. & ZULOAGA F.O. (eds.), BARBOZA G. E. (coord.): Flora Argentina vol. **13**, Solanaceae, pp. 231–264. – Buenos Aires & Córdoba: IOBDA-IMBIV, CONICET.
- BERNHARDT K.-G., NAUMER-BERNHARDT E., OSCHATZ M.-L., STOECKL N. & WERNISCH M. M. (2013): Floristische Inventarisierung als Beitrag zur Erfassung regionaler Phytodiversität am Beispiel der Gemeinde Zwentendorf an der Donau (Bezirk Tulln, Niederösterreich). – Wiss. Mitt. Niederösterreich. Landesmus. **24**: 127–172.
- BITTER G. (1914): Weitere Untersuchungen über das Vorkommen von Steinzellkonkretionen im Fruchtfleisch beerentragender Solanaceen. – Abh. Naturwiss. Vereins Bremen **23**: 114–163.
- EDMONDS J. M. (1974): A synopsis of the taxonomy of *Solanum* sect. *Solanum* (*Maurella*) in South America. – Kew Bull. **27**: 95–114.
- FISCHER M. A., OSWALD K. & ADLER W. (2008): Exkursionsflora für Österreich, Liechtenstein und Südtirol. – 3rd ed. Linz: Oberösterreichische Landesmuseen.
- FORSTNER W. & HÜBL E. (1971): Ruderal-, Segetal- und Adventivflora von Wien. – Wien: Verlag Notring.
- JÄGER E. J. (Ed.) (2017): Rothmaler – Exkursionsflora von Deutschland. Gefäßpflanzen: Grundband. 21., durchgesehen Aufl. – Berlin etc.: Spektrum.
- MELZER H. (1976): Neues von Flora zur Steiermark, XVIII. – Mitt. Naturwiss. Vereines Steiermark **106**: 147–159.

- MELZER H. & BARTA T. (1997): *Anthoxanthum aristatum* Boissier, das Grannen Ruchgras, neu für Burgenland und andere Neuigkeiten zur Flora dieses Bundeslandes, von Wien und Niederösterreich. – Linzer Biol. Beitr. **29**: 899–919.
- PERALTA I. E., SPOONER D. M. & KNAPP S. (2008): Taxonomy of wild tomatoes and their relatives (*Solanum* sections *Lycopersicoides*, *Juglandifolia*, *Lycopersicon*; Solanaceae). – Syst. Bot. Monogr. **84**: 1–186.
- RANIL R. H. G., PROHENS J., AUBRIOT X., NIRAN H. M. L., PLAZAS M., FONSEKA R. M., VILANOVA S., FONSEKA H. H., GRAMAZIO P. & KNAPP S. (2017): *Solanum insanum* L. (subgenus *Leptostemonum* Bitter, Solanaceae), the neglected wild progenitor of eggplant (*S. melongena* L.): a review of taxonomy, characteristics and uses aimed at its enhancement for improved eggplant breeding. – Genet. Resources Crop Evol. **64**: 1707–1722. <https://doi.org/10.1007/s10722-016-0467-z>
- SÄRKINEN T., BARBOZA G. E. & KNAPP S. (2015a): True Black nightshades: Phylogeny and delimitation of the Moreloid clade of *Solanum*. – Taxon **64**: 945–958. <https://doi.org/10.12705/645.5>
- SÄRKINEN T., BADEN M., GONZÁLES P., CUEVA M., GIACOMIN L. L., SPOONER D.M., SIMON R., JUÁREZ H., NINA P., MOLINA J. & KNAPP S. (2015b): Listado anotado de *Solanum* L. (Solanaceae) en el Perú. Annotated checklist of *Solanum* L. (Solanaceae) for Peru. – Revista Peruana Biol. **22**: 3–62. <https://doi.org/10.15381/rpb.v22i1.1112>
- SÄRKINEN T. & KNAPP S. (2016): Two new non-spiny *Solanum* (Solanaceae) from the Gran Chaco Americano and a key for the herbaceous glandular-pubescent solanums from the region. – PhytoKeys **74**: 19–33. <https://doi.org/10.3897/phytokeys.74.10159>
- VALDÉS B. (2012): Solanaceae. – Euro+Med Plant Database. <http://ww2.bgbm.org/EuroPlusMed/> [accessed 1 June 2017].
- WALTER J., ESSL F., NIKLFELD H. & FISCHER M. A. (2002): Gefäßpflanzen. – In: ESSL F. & RABITSCH W. (Eds.): Neobiota in Österreich: pp. 46–173. – Wien: Umweltbundesamt.

Received 31 May 2017

Revision received 11 August 2017

Accepted 16 September 2017

ZOBODAT - www.zobodat.at

Zoologisch-Botanische Datenbank/Zoological-Botanical Database

Digitale Literatur/Digital Literature

Zeitschrift/Journal: [Neilreichia - Zeitschrift für Pflanzensystematik und Floristik Österreichs](#)

Jahr/Year: 2018

Band/Volume: [9](#)

Autor(en)/Author(s): Knapp Sandra

Artikel/Article: [Solanum pimpinellifolium . new for the alien flora of Austria, with comments on Austrian records of S. triflorum and S. nitidibaccatum 49-53](#)