

S. Cambria, E. Banfi, F. Verloove & G. Domina

***Solanum lanceolatum* (Solanaceae) in Sicily: a new alien species for the European flora**

Abstract

Cambria, S., Banfi, E., Verloove, F. & Domina, G.: *Solanum lanceolatum* (Solanaceae) in Sicily: a new alien species for the European flora. — Fl. Medit. 25: 115-120. 2015. — ISSN: 1120-4052 printed, 2240-4538 online.

Solanum lanceolatum Cav. (Solanaceae) is a species native to Central America (Mexico, Belize, Guatemala and Panama), that has been found naturalized near Sutera and Porto Empedocle (Sicily). This is the first record in Italy and Europe.

Key words: *Solanum*, alien flora, xenophytes, Mediterranean area.

Introduction

During a field trip in the territory of Sutera (Caltanissetta, Central Sicily) in the autumn of 2014, an unknown species of *Solanum* was observed. Herbarium surveys in PAL allowed to find a similar specimen from another locality (Porto Empedocle, Agrigento), identified as *Solanum torvum* Sw. On the basis of careful research this identification proved to be erroneous and the two populations have to be referred to *S. lanceolatum* Cav., not previously reported as naturalized in Italy and Europe.

This species originates from Mexico (especially Central and western Mexico), Belize, Guatemala and western Panama (Nee 1993). It was introduced and very locally naturalized elsewhere in warm-temperate to subtropical regions of the world, for instance in California (USA) where *S. lanceolatum* was once introduced as a garden plant and now is widely naturalized and considered a noxious weed (Jepson eFlora). In Europe this species is rare in gardens and mostly confined to Botanic Gardens. Like *Solanum bonariense* L. this species belongs to *Solanum* section *Torva* Nees, a taxonomically complex assemblage with ca. 30 or up to 50 species in the Neotropics (Whalen 1984; Nee 2006) in which species delimitation is often critical. Characteristic features of the section are: presence of stellate hairs; berries glabrous, firm with leathery pericarp; anthers equal; inflorescence branched and many-flowered; etc. (Whalen 1984). Species from this section typically are plants from secondary habitats and often have weedy tendencies. In southern Europe (incl. Canary Islands), the following species have been reliably record-

ed in the wild so far: *S. bonariense* (more or less widespread), *S. chrysotrichum* Schldl. (Gran Canaria; Verloove 2013) and *S. lanceolatum* (this paper). Claims of *S. torvum* Sw. (Raimondo & Orlando 1978 for Sicily; Mallol & Maynés 2008 for Spain) are erroneous and referable to *S. lanceolatum* and *S. chrysotrichum* (Flora Catalana) respectively. According to Euro+Med (2006-); DAISIE online Database; Celesti & al. (2009, 2010) this is the first record of *S. lanceolatum* in Italy and Europe.

Description of the species

Within sect. *Torva* *Solanum lanceolatum* most closely resembles *S. bonariense*. It is distinguished in often being taller (tree-like and up to 5m tall in mature plants; vs. shrub-like and rarely exceeding 1.5m), stems more often armed in the lower part with straight brownish prickles up to 10 mm long (vs. usually unarmed or with a few small prickles up to 2 mm long) and the denser indumentum, especially younger plant parts being densely white-pubescent (vs. appearing more or less glabrous to the naked eye with few, non-overlapping stellate hairs). Its flowers are always purplish-blue, while they are often white in *S. bonariense* (sometimes purplish-blue). Also, its stellate hairs have rays held at different angles.

The binomial *Solanum paniculatum* L. had also been put forward for the plant from Sicily. This is a similar species from section *Torva*, native to South America (Brazil, Paraguay, Argentina). This and *S. lanceolatum* are much alike in general habit, leaf shape, floral characters, etc.; moreover, both are very polymorphic. However, lower leaf surface is persistently whitish-tomentose in *S. paniculatum* while in some forms of *S. lanceolatum*, including those introduced in European gardens in the late 1700s, lower leaf surface becomes glabrescent (comm. M. Nee to F. Verloove January 2011). Moreover, its fruits are larger and pendent, a very characteristic feature of this species (Schinini & López 2001). Also, *S. paniculatum* is not known to have been introduced to Europe in the past.

Despite being of Central American origin, *Solanum lanceolatum* was described from a cultivated plant grown in the Botanic Garden of Madrid, Spain (Knapp 2007). Plants found in Europe often slightly differ from those found in most wild populations in Central America, especially in having the lower leaf surface much less densely pubescent. This may be either because of the genotype or because of European growing conditions. A third possibility, however, is that *S. bonariense* and *S. lanceolatum*, allopatrically distributed in the wild, intergrade in cultivation. Several species of section *Torva* are known to freely hybridize, these hybrids often being fertile (comm. F. Chiarini, Cordoba, Argentina to F. Verloove; March 2015). It cannot be excluded that non-native populations of *Solanum lanceolatum*, originating from escaped plants, have some blood of *S. bonariense*. The populations naturalized in Sicily, however, perfectly correspond with the plants usually seen in Central America.

Key for the identification of species of *Solanum* section *Torva* in Europe

1. Stem and leaves sparsely stellate hairy, glabrescent with age, unarmed or rarely with very sparse prickles 0.5-2 mm long. Ripe berry orange-red. Shrub 1-2(-2.5) m tall
.....*Solanum bonariense*

- 1. Stem and leaves persistently and densely stellate hairy, usually armed with prickles 2.5-10 mm long. Ripe berry green to yellow. Shrub or small tree 1.5-6 m tall2
- 2. Stem indumentum ferruginous (rusty colored). Corolla white*S. chrysotrichum*
- 2. Stem indumentum whitish. Corolla purplish-blue *S. lanceolatum*

Location and ecology

S. lanceolatum is actually known only from two stands in Sicily. The first station is located near Sutera in the central part of the island (Fig. 1). It consists of about one hundred adult specimens with a remarkable natural renewal. *S. lanceolatum* was, probably, originally intro-



Fig.1. *S. lanceolatum* near Sutera (Caltanissetta, central Sicily) (Photo by G. Di Gregorio).

duced as an ornamental plant in the nearby gardens and subsequently naturalized in clay slopes and in the road edges. Currently it takes place in the communities of *Arundinetum plinianae* Biondi, Brugiapaglia, Glee & Ballelli 1992, a monospecific formation dominated by *Arundo collina*, that prefers clay substrates where often landslide slip occurs (Biondi & al. 1992). Plants were observed in flower between October and December; fruits, however, are not produced, suggesting that the current spread of the species in the station of Sutera entirely depends on vegetative reproduction. The station occurs at about 250 m a.s.l., in the Meso-mediterranean belt. The other stand is located near Porto Empedocle in Southern Sicily (Fig. 2), on carbonate lithosoil, in a wasted land, under thermo-mediterranean bioclimate. Since 1978 the population is firmly established in an area that covers ca. 1500 m². In this locality fruit set was shown to be abundant and numerous plantlets were observed. However, the species does not show tendency to spread further.

Specimina visa:

ITALIA (SIC): Sutera (Caltanissetta), bordo strada su substrato argilloso, (37°31'7.57"N 13°42'19.32"E), 256 m, 01 Dec 2014, leg. S. Cambria & G. Di Gregorio, det. F. Verloove, E. Banfi, S. Cambria & G. Domina, Vidit Aaron Rodriguez (Mexico), (FI, BR)



Fig. 2. *S. lanceolatum* near Porto Empedocle (Agrigento, southern Sicily) (Photo by G. Domina).

ITALIA (SIC): Porto Empedocle (Agrigento), strada Agrigento-Porto , 37° 17' 39" N, 13° 31' 25" E, 60 m s.l.m., 15/3/2015, leg. G. Domina, det. F. Verloove, E. Banfi, S. Cambria & G. Domina, Vidit Aaron Rodriguez (Mexico), (PAL).

Acknowledgements

We thank Aaron Rodriguez (Mexico), Sandra Knapp (UK) and Francesco M. Raimondo (Italy) for valuable comments during the preparation of the manuscript and Giuseppe Di Gregorio (Palermo) for the photos of *Solanum lanceolatum* and his friendly availability in the field.

References

- Biondi, E., Brugiapaglia, E., Allegranza, M. & Ballelli, S. 1992: La vegetazione del litorale marchigiano (Adriatico centro-settentrionale). – Coll. Phytosoc **19**: 429-460.
- Celesti-Grapow, L., Alessandrini, A., Arrigoni, P. V., Banfi, E., Bernardo, L., Bovio, M., Brundu, G., Cagiotti, M., Camarda, I., Carli, E., Conti, F., Fascetti, S., Galasso, G., Gubellini, L., La Valva, V., Lucchese, F., Marchiori, S., Mazzola, P., Peccenini, S., Poldini, L., Pretto, F., Prosser, F., Siniscalco, C., Villani, M. C., Viegi, L., Wilhalm, T. & Blasi, C. 2009: The inventory of the non-native flora of Italy. – Pl. Biosyst. **143**(2): 386-430. doi: 10.1080/11263500902722824
- , —, —, Assini, S., Banfi, E., Barni, E., Bovio, M., Brundu, G., Cagiotti, M. R., Camarda, I., Carli, E., Conti, F., Del Guacchio, E., Domina G., Fascetti, S., Galasso, G., Gubellini, L., Lucchese, F., Medagli, P., Passalacqua, N. G., Peccenini, S., Poldini, L., Pretto, F., Prosser, F., Vidali, M., Viegi, L., Villani, M. C., Wilhalm, T. & Blasi, C. 2010: Non-native flora of Italy: Species distribution and threats. – Pl. Biosyst. **144**(1): 12-28. doi: 10.1080/11263500903431870.
- Euro+Med (2006-): Euro+Med PlantBase - the information resource for Euro-Mediterranean plant diversity: <http://ww2.bgbm.org/EuroPlusMed/> [accessed 01/10/2015].
- Knapp, S. 2007: Lectotypification of Cavanilles' names in *Solanum* (*Solanaceae*). – Anales Jard. Bot. Madrid **64**(2): 195-203.
- Mallol, A. & Maynés, J. 2008 : Nous xenòfits al baix empordà (Catalunya). – Acta Bot. Barc. **51**: 59-77.
- Nee, M. 1993: *Solanaceae* II. – Pp. 52-106 in: Sosa, V., Flora de Veracruz, **72**. – Xalapa, Veracruz.
- 2006: Synopsis of *Solanum* in the New World. – Pp. 285-333 in: Nee, M., Symon, D. E. & Lester R. N. J. (eds), *Solanaceae* IV. – London.
- Raimondo, F. M. & Orlando, A. 1978: Prima segnalazione in Italia di *Solanum torvum* Sw. – Inform. Bot. Ital. **10**(1): 43-45.
- Schinini, A. & López, M. G. 2001: *Solanum paniculatum* (*Solanaceae*) en Argentina y Paraguay. – Kurtziana **29**(1): 99-103.
- Verloove, F. 2013: New xenophytes from Gran Canaria (Canary Islands, Spain), with emphasis on naturalized and (potentially) invasive species. – Collect. Bot. **32**: 59-82.
- Whalen, M. D. 1984: Conspectus of Species Groups in *Solanum* Subgenus *Leptostemonum*. – Gentes Herbarium **12**(4): 179-282.

Other Online sources:

Solanaceae Source: <http://solanaceaesource.org/solanaceae/solanum-lanceolatum-2>

Jepson Manual: http://ucjeps.berkeley.edu/cgi-bin/get_IJM.pl?tid=44872

CalFlora: http://www.calflora.org/cgi-bin/species_query.cgi?where-taxon=Solanum+lanceolatum

Flora Catalana: <http://www.floracatalana.net/solanum-chrysotrichum-schldl->

DAISIE - Delivering Alien Invasive Species Inventories for Europe: <http://www.europe-aliens.org/>

Addresses of the authors:

Salvatore Cambria¹, Enrico Banfi², Filip Verloove³ & Giannantonio Domina¹,

¹Herbarium Mediterraneum Panormitanum, Università di Palermo, via Lincoln 2.
90133 Palermo. E-mail : cambria_salvatore@yahoo.it

²Museo civico di storia naturale di Milano, Corso Venezia, 55, 20121 Milano.

³Botanic Garden Meise, Nieuwelaan 38, B-1860 Meise, Belgium.