



FIRST EUROPEAN RECORD OF *SOLANDRA MAXIMA* (SESSÉ & MOC.) P.S.GREEN (SOLANACEAE)

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ABSTRACT – In the present work, *Solandra maxima* (Sessé & Moc.) P.S.Green (Solanaceae), a neophyte native to Mesoamerica, is reported for the first time as spontaneous for Italy and Europe: some notes on the place of discovery are provided and the invasiveness status is discussed. According to our observations the species must be considered as a casual alien.

KEYWORDS: ALIEN SPECIES, INVASIVENESS, ITALY, VASCULAR FLORA

INTRODUCTION

Solandra Sw. (Solanaceae) is a neotropical genus of phytochemical, ethnobotanical and ornamental interest (Barnardello & Hunziker, 1987; Hunziker, 2001) distributed from Mexico (center of diversification) and widespread from West Indies to South America (Peru, Bolivia and Brazil). It includes 10 species growing in neotropical rain forests up to 3000 m a.s.l. (Barnardello & Hunziker, 1987; Hunziker, 2001). It includes woody lianas, high climbing epiphytic shrubs and small trees with coriaceous leaves. The inflorescence is terminal, a highly reduced cyme, usually with a single flower. The calyx is 3-10 cm long, usually irregularly 2-5-lobed and zygomorphic. The corolla is very large and showy, 13-40 cm long, infundibuliform to cyathiform, with rounded, entire to lacinate or fimbriate lobes. The stamens have the filaments adnate to the column tube and the basifixed anthers. The ovary is 2-carpellate, 4-locular. The fruit is a conical, leathery berry, with round or reniform seed (Barnardello & Hunziker, 1987; Shaw, 2000). The genus is not reported as spontaneous in European floras

(e.g. Moore, 1972; Stace, 2010; Gallego et al., 2012) or Italian floras and checklist (e.g. Fiori, 1926; Pignatti, 1982; Conti et al., 2005, 2007; Celesti-Grappo et al., 2009, 2010). By this paper *Solandra maxima* (Sessé & Moc.) P.S.Green is recorded for the first time in Europe (southern Italy). Some notes on the place of discovery are provided and the invasiveness status is discussed.

MATERIALS AND METHODS

Field research in southern Italy was undertaken from 2014 to 2016. The species was identified according to D'Arcy (1973), Barnardello & Hunziker (1987), Shaw (2000) and Hunziker (2001). The protologue by Sessé & Mociño (1888) was also examined. Collected specimens are conserved in *Herbarium Porticense* (PORUN, acronym according to Thiers, 2011). Geocoding of the Italian locality of the plant was performed using a portable GPS device (GPS map 60CSx, Garmin, USA), previously calibrated (geographic system UTM WGS84).

European and Italian literature was examined to detect previous indications of the species in Europe and Italy. The recent botanical literature on the exotic flora of the Campania region (e.g. Stinca & Motti, 2009; Rosati et al., 2012; Stinca et al., 2014, 2015, 2016; Del Guacchio, 2014, 2015) was also analysed.

The status of naturalization was defined according to Pyšek et al. (2004) through the monitoring of the Italian population. In detail it was observed the presence of the species and its ability to spread in the field during three consecutive years (2014 to 2016).

RESULTS AND DISCUSSION

Solandra maxima (Sessé & Moc.) P.S.Green, Bot. Mag. 176(3): t. 506. 1967.

≡ *Datura maxima* Sessé & Moc., Plantae Nouae (sic!) Hispaniae 25. 1888 [1887 pubbl. 1888].

Typus (Sarmiento & Boettler, 2011): Mexico, Guerrero, in calidis Novae Hispaniae regionibus, 1789, *M. Sessé y Lacasta & J. M. Mociño 1570* (holotypus: MA 604562; isolectotypus: MA 604563, 604564, 604565, 604596, BM 775934, F 847209).

Solandra maxima (commonly known as Cup of gold) is native to the tropical forest of the Mesoamerica, from Mexico to Colombia and Venezuela (e.g. Barnardello & Hunziker, 1987; Sarmiento & Boettler, 2011). In Europe it is sometimes cultivated as an outdoor ornamental plant (G. Salerno and A. Stinca pers. obs.). In Italy it was introduced to cultivation probably in the last decades. As a matter of fact, *S. maxima* is not reported in a comprehensive Italian manual of ornamental shrubs (Motti, 2001).

The field surveys allowed us to find the species at Conca dei Marini, between Marina di Furore and Penna (province of Salerno, Campania region) in southern Italy. The site is located on the Amalfi coast of the Sorrento Peninsula, on the South foothills of Lattari Mountains, at 35–45 m a.s.l. (UTM WGS84: 33 T 462519 E and 4496050 N). This area is included in the Site of Community Importance “Valloni della Costiera Amalfitana” - IT8050051 (Habitats Directive 92/43/EEC) and Lattari Mountains Regional Park (established by Regione Campania in 2003).

Climate (thermopluviometric data from Ravello meteorological station, 315 m a.s.l., about 5 km from the analysed site) is referable to the Mediterranean type, with an average annual temperature of 15.1°C, average annual rainfall of 1201 mm and a summer drought period from May to August (Caputo et al., 1994).

The *S. maxima* population was found on the limestone cliff on the edge of a natural scrub formation (exposure South-

East, slope 60–90°), along the Strada Statale 163 Amalfitana. This population covers an area of approximately 50 m² and consists of seven individuals, with an average diameter of 2.4 cm. However, the steepness and the inaccessibility of the site makes it difficult to define the exact number of plants, considering also that this species produces very long (more than 10 m in the study area) branched stems. All the surveyed individuals were flowering in the spring 2015 and 2016, but fruit production was not observed.

Frequently occurring taxa in the observed plant community are: *Centaurea cineraria* L. subsp. *cineraria*, *Centranthus ruber* (L.) DC. subsp. *ruber*, *Helichrysum litoreum* Guss., *Seseli polyphyllum* Ten., *Brassica fruticulosa* Cirillo subsp. *fruticulosa*, *Ceratonia siliqua* L., *Emerus major* Mill., *Euphorbia dendroides* L., *Ferula communis* L., *Ficus carica* L., *Hedera helix* L. subsp. *helix*, *Olea europaea* L., *Pistacia lentiscus* L., *Rhamnus alaternus* L. subsp. *alaternus*, *Rosmarinus officinalis* L., *Spartium junceum* L., *Teucrium fruticans* L. subsp. *fruticans*, *Opuntia ficus-indica* (L.) Mill., *Erigeron sumatrensis* Retz. and *Dactylis glomerata* L. subsp. *glomerata*. Particularly in this locality *S. maxima* may compete with endemic species (Peruzzi et al., 2015): *Centaurea cineraria* subsp. *cineraria* (central and southern Italian Peninsula), *Helichrysum litoreum* (Italian Peninsula, Sicily and Sardinia) and *Seseli polyphyllum* (exclusive of the Campania Region: Sorrento Peninsula, Island of Capri and Partenio Mountains).

Solandra maxima was introduced through residue pruning of plants cultivated nearby and subsequently spread. This hypothesis was confirmed through interviews with local people. Indeed, in the study area this plant can easily produce adventitious roots on the branches (G. Salerno and A. Stinca pers. obs.) and is sometimes cultivated as ornamental in the Sorrento Peninsula gardens, e.g. Amalfi, Conca dei Marini, Furore and Maiori (Caneva et al., 2007).

In Italy this neophyte was detected for three consecutive years (2014 to 2016), showing a good vegetative propagation. A sexual reproduction was not observed. According to field observations, this species shows a considerable resistance to drought and cold. According to Pyšek et al. (2004), the observation period is too short to understand the success in vegetative propagation and to declare a state of naturalized species. Waiting for further field investigations to fully assess the proper status attribution, at this state of knowledge it must be considered a casual alien. Even if it cannot be reported as naturalized species in Italy at the present state of knowledge, it has to be considered in any case a potential threat as it may colonize natural and seminatural habitats.

Specimen examined

ITALY: Campania, Conca dei Marini between Marina di Furore and Penna (Salerno) (UTM WGS84: 33T 462519

E - 4496050 N), limestone cliff on the edge of a natural scrub formation, 40 m a.s.l., leg. et det. *G. Salerno & A. Stinca*, 30 December 2014 (PORUN); *ibidem*, leg. *A. Stinca & M. Ravo*, det. *G. Salerno & A. Stinca*, 18 August 2015 (PORUN); *ibidem*, obs. et det. *A. Stinca*, 27 November 2016.

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