



ATTI  
DELLA  
SOCIETÀ TOSCANA  
DI  
SCIENZE NATURALI

MEMORIE • SERIE B • VOLUME CXXVII • ANNO 2020



Edizioni ETS



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### PROCESSI VERBALI

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## NOTES TO THE NON-NATIVE FLORA OF CAMPANIA (SOUTHERN ITALY)

**Abstract** - E. DEL GUACCHIO, A. DE NATALE, A. STINCA, *Notes to the non-native flora of Campania (Southern Italy)*.

This contribution adds new information on the non-native flora of Campania, with special attention to doubtfully present taxa. After new observations in the field and on herbarium material, joined with a deeper insight into literature, 13 taxa are to be excluded from the regional flora (*Viola williamsii* must be excluded from the flora of Italy), while one was probably present in the past. In addition, the occurrence, even in the past, of further 3 taxa is to be regarded as very doubtful. However, our researches allow to identify localities for a naturalized species previously reported only generically for the region, i.e. *Chasmanthe bicolor* (Iridaceae). In addition, *Senecio squalidus* subsp. *chrysanthemifolius* (Asteraceae), naturalized, must be added to the regional flora. We propose also the naturalized status for *Kalanchoë ×boughtonii* (Crassulaceae). *Drosanthemum hispidum* (Aizoaceae) is confirmed as a casual alien. Moreover, further 14 new casual aliens are added to the regional flora, among which *Acalypha supera* (Euphorbiaceae), *Begonia* Semperflorens Cultorum Group (Begoniaceae), *Canna ×generalis* (Cannaceae), *Jasminum polyanthum* (Oleaceae), *Lantana Callowiana* Hybrid Group (Verbenaceae), and *Sedum rubrotinctum* (Crassulaceae) are new to Italy. Most of the new additions is represented by plants escaped from gardens. Therefore, the cultivation of ornamental plants once again results a relevant pathway of introduction. Finally, some explanatory notes to a few data occurring in the last regional checklist are provided.

**Key words** - exotic flora, cultivar, floristic literature, introduction pathways, Campania, Italy, Mediterranean Basin

**Riassunto** - E. DEL GUACCHIO, A. DE NATALE, A. STINCA, *Note alla flora non nativa della Campania (Italia meridionale)*.

Il presente contributo aggiunge nuove informazioni sulla flora non nativa della Campania, con particolare riguardo a taxa di dubbia presenza. A seguito di nuove osservazioni di campagna, controlli di materiali d'erbario e riscontri bibliografici, tredici taxa devono essere esclusi dalla flora regionale (*Viola williamsii* anche da quella italiana), mentre uno era probabilmente presente in passato. Inoltre, la presenza, anche in passato, di ulteriori tre taxa deve essere considerata molto dubbia. La ricerca ha consentito di identificare le stazioni di una specie naturalizzata, *Chasmanthe bicolor* (Iridaceae), finora nota solo genericamente per la regione. *Senecio squalidus* subsp. *chrysanthemifolius* (Asteraceae), una volta naturalizzato, deve essere aggiunto alla flora regionale. Proponiamo che anche *Kalanchoë ×boughtonii* (Crassulaceae) sia considerata naturalizzata. *Drosanthemum hispidum* (Aizoaceae) è confermata come esotica casuale. Quattordici nuove specie devono essere aggiunte alla flora regionale come esotiche casuali, delle quali risultano nuove per l'Italia *Acalypha supera* (Euphorbiaceae), *Begonia*

Semperflorens Cultorum Group (Begoniaceae), *Canna ×generalis* (Cannaceae), *Jasminum polyanthum* (Oleaceae), *Lantana Callowiana* Hybrid Group (Verbenaceae), and *Sedum rubrotinctum* (Crassulaceae). Per la maggior parte, i nuovi inserimenti sono rappresentati da piante sfuggite da giardini, a conferma della rilevanza della coltivazione di piante ornamentali quale sorgente di introduzioni. Infine, si forniscono delle note esplicative in merito ad alcuni dati relativi alla più recente *checklist* regionale.

**Parole chiave** - flora esotica, cultivar, letteratura floristica, vie di introduzione, Campania, Bacino del Mediterraneo

### INTRODUCTION

The study of the non-native vascular flora in southern Europe, also because it is linked to ecological and conservation problems, has become a subject of major interest among the scholars, both at national (e.g., Almeida & Freitas, 2012; Sanz-Elorza *et al.*, 2004; Arianotsou *et al.*, 2010; Barina *et al.*, 2014; Uludağ *et al.*, 2017) and regional level (e.g., Sanz-Elorza *et al.*, 2004; Dal Cin D'Agata *et al.*, 2009; Banfi & Galasso, 2010; Arrigoni & Viegi, 2011; Jeanmonod *et al.*, 2011; Camarda *et al.*, 2016). In particular, after the publication of the Italian checklists (Celesti-Grappo *et al.*, 2009, 2010), the non-native flora of Campania has been greatly enriched, with numerous contributions of various breadths and scopes (e.g., Del Guacchio, 2013, 2015a,b; Iamonicò & Del Guacchio, 2011; Stinca *et al.*, 2012, 2013a; De Castro *et al.*, 2013; Celesti-Grappo *et al.*, 2016; Stinca *et al.*, 2016; Salerno & Stinca, 2017; Stinca *et al.*, 2017; Motti *et al.*, 2018; Stinca *et al.*, 2019a, 2019b; Stinca, 2019; Rosati *et al.*, 2020). Above all, a new regional checklist is now available (Galasso *et al.*, 2018a). In particular, a comprehensive work on this subject has been recently published (Del Guacchio & La Valva, 2017).

Indeed, several critical issues need further study, including also the correct identifications of some taxa. In the present work, we shed light on some details of the alien flora of Campania, with amendments and crit-

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ical notes about doubtful or erroneous reports. In addition, the results of further researches are presented, with new or confirmed taxa for Campania.

#### MATERIALS AND METHODS

This contribution is based on the revision of specimens preserved at PORUN (collection “Herb. Stinca”) and in the personal herbaria of the other two authors, consultable at NAP (*Herb. E. Del Guacchio*, *Herb. A. De Natale*) (abbreviations according to Thiers, 2019), on the critical review of the literature (an almost complete list has been provided by Del Guacchio & La Valva, 2017, Appendix); and on new field researches throughout the region during the years 2015-2019.

The taxa are reported by alphabetical order and the nomenclature follows Galasso *et al.* (2018a). For each taxon, family, native range [according to WCSP (2019) and USDA-ARS (2018)], and the most relevant synonyms are reported. For both new and confirmed taxa, the relevant specimens (UTM datum WGS84) are reported with the gathering data translated into English. For the taxa new for the region, life form [according to Raunkiaer (1934), modified according to Pignatti *et al.* (2017-2019) and WCSP (2019), and verified by personal observations], causes and pathways of introductions are also reported. When a taxon is new for Italy, the literature used for the identification and nomenclature has been cited in note.

For the evaluation of the invasiveness status in Campania of the studied taxa, Pyšek *et al.* (2004), as modified by Galasso *et al.* (2018a), has been followed. Except when otherwise reported, all the taxa included in the present contribution are to be regarded as neophytes. The following legend has been employed:

- [?] = Taxon doubtfully occurring in Campania
- [-] = Taxon to be excluded from the alien flora of Campania
- [\$] = Explanatory note to the datum in Galasso *et al.* (2018a)
- [0] = Casual alien not found after 1950 in Campania
- [C+] = New casual alien for Campania
- [C!] = Confirmed casual alien for Campania
- [E?] = Naturalized alien for Campania, but here possibly extinct
- [It+] = New casual alien for Italy
- [It-] = Taxon to be excluded from the alien flora of Italy
- [N+] = New naturalized alien for Campania
- [N!] = Confirmed naturalized alien for Campania

#### RESULTS

**[It+] *Acalypha supera*** Forssk. [= *A. brachystachya* Hornem.; = *Ricinocarpus brachystachyus* (Hornem.) Kuntze] (Euphorbiaceae) (tropical and subtropical areas of Africa and Asia) — Specimen: Altavilla Silentina (Salerno), contrada Castelluccio, Nursery “Garden Flora sul Calore” [33T 509399E 4488382N], weed in damp substrates in the greenhouses, 29 m a.s.l., 13 September 2013, *E. Del Guacchio s.n.*, det. E. Del Guacchio (*Herb. E. Del Guacchio*). Note: A scapose therophyte. We adopt the prior name *A. supera*, because the proposal of rejection of the name *A. brachystachya* suggested by Sagun *et al.* (2010) has not been formalized (cf. WCSP, 2019). The examined individuals were identified by the keys and the descriptions in Radcliffe-Smith (1986) and Qiu & Gilbert (2008). They were accidentally introduced by nursery material. This appears as the only indication for Europe at present.

**[-] *Acer rubrum*** L. (Sapindaceae) (northern America) — Note: This species is generically reported for the peninsula of Sorrento by Candida (Cavolini, 1853), but probably by mistake with some other autochthonous maple, or, at most, with cultivated individuals.

**[\$] *Allium scorodoprasum*** L. (Amaryllidaceae) (Europe, western Asia) — Note: Tenore (1830) reported this taxon (within two varieties) for the fields of the “*Regno di Napoli*” [Kingdom of Naples], and namely for Ischia Island. In this latter locality, *A. scorodoprasum* would be «more copious than elsewhere», and commonly employed for gastronomic purposes. Indeed, Tenore (1822) (for the datation of this work, see Peruzzi *et al.* 2019) added that both the two varieties were called “Aglione” by the islanders. Comparing this information with that by Gussone (1855), it can be concluded that “*Allium scorodoprasum*” sensu Tenore is just «*Allium ampeloprasum*» sensu Gussone [= *A. porrum* L. subsp. *polyanthum* (Schult. & Schult.f.) Jauzein & J.-M. Tison, according to Jauzein & Tison (2005)]. As a proof, no one indicated *A. scorodoprasum* anymore for Ischia island (i.e., Parlatore, 1857; Ricciar-di *et al.*, 2004), and later Tenore (1831) himself limited its occurrence to Apulia. For these reasons, the taxon is listed as recorded by mistake in Galasso *et al.* (2018a).

**[\$] *Ambrosia artemisiifolia*** L. (Asteraceae) (northern America) — Note: According to Pignatti (1982) this plant was in “strong expansion” in the Neapolitan area at that time (no precise locality was provided). On his note is based the generic indication for the region by Viegi & Cela Renzoni (1981). However,

apparently nobody else observed the plant in Campania in the last decades. In fact, it has been reported as a no longer found unit (e.g., Celesti-Grapow *et al.*, 2007). Montelucci (1935) wrote that some specimens of *A. maritima* L. at NAP (especially one collected in Ischia island by Gussone), although of difficult identification, could be referred to *A. artemisiifolia*. We could not locate such a material at NAP (Collection “Gussone – Generale”); while Ricciardi *et al.* (2004) does not cite the plant in the flora of the island. For these reasons, the taxon is listed as doubtfully occurring in Del Guacchio & La Valva (2017) and Galasso *et al.* (2018a).

[–] ***Anchusa litorea*** Moris (Boraginaceae) (Sardinia) — Note: Terracciano (1917) published the name *A. litorea* var. *flegrea* indicating as *loci classici* two localities nowadays in the municipality territory of Naples. In the successive local or Italian floras, as well as in the recent treatment by Cecchi & Selvi (2017), there is no mention of this taxon, which was nevertheless validly published. There is no mention of it even in Motti & Ricciardi (2005), and we were not able to locate any pertinent specimen at NAP. Also considering the very limited native range of *A. litorea* in the south-western Sardinia, its habitat and its extreme rarity (Cecchi & Selvi, 2017), we regard as more probable that the taxon described by Terracciano should be referred to another species. Note for example that the authentic *A. litorea* is an annual species, while Terracciano (1917) described a biennial herb.

[–] ***Antirrhinum ovatum*** Eastw. [= *Howellii-la ovata* (Eastw.) Rothm.] (Plantaginaceae) (northern America) — Note: This species was reported by Baccharini (1881: 163) among the plants of ancient introduction into Vesuvius and Mount Etna, but without doubt by *lapsus calami*. It is probably a mistake for “*Antirrhinum orontium*”, i.e. *Misopates orontium* [L.] Raf., as this taxon appears in the floristic list (Baccarini 1881: 198), where “*Antirrhinum ovatum*” is missing.

[It+] ***Begonia Semperflorens Cultorum Group*** [= *B. semperflorens* sensu hort., non Link & Otto] (Begoniaceae) (horticultural hybrid) — Specimen: Cava de’ Tirreni (Salerno), above Arcara restaurant, via O. Di Benedetto [33T 4759E 4505N], accumulation of wet soil near a garden, 260 m a.s.l., 25 October 2002, *E. Del Guacchio & U. Petolicchio*, n. 4228, det. E. Del Guacchio (*Herb. E. Del Guacchio*). Observation: Procida Island (Naples), via Vittorio Emanuele, pavings [33T 4177E 4512N], 19 September 2013 (*E. Del Guacchio*). Note: For the nomenclature, see USDA-ARS (2018). This group of ornamental cultivars arose from the hybridization between *B. cucullata* Willd. (southern America) and *B. subvillosa* Klotzsch (= *B. schmid-*

*tiana* Regel) (Brazil). It is very popular in Campania as a “seasonal plant”, even if in the local climate it can survive to winter as a short-lived perennial (caespitose hemicryptophyte). It becomes spontaneous by seeds, but rarely, and it is not reported for Italy in Galasso *et al.* (2018a).

[It+] ***Canna xgeneralis*** L.H.Bailey (Cannaceae) (horticultural hybrid) — Specimen: Albanella (Salerno), road “S.P. 11” [33T 507294E 4483514N], ditches, 25 m a.s.l., 12 June 2016, *E. Del Guacchio s.n.*, det. E. Del Guacchio (*Herb. E. Del Guacchio*). Note: This name designates a hybrid between *C. indica* L. and *C. glauca* L. or *C. iridiflora* Ruiz & Pav. (Kress & Prince, 2000) with staminodes with parallel sides and flat margins (Ratter, 1984). Nowadays in Campania, the cultivation of *C. indica* L. (widely naturalized throughout the warm areas of Campania: Del Guacchio & La Valva, 2017; Motti *et al.*, 2018) is waning at present and these and other hybrids are by far preferred in the gardens. However, they are almost infertile (as in the observed individuals) and spread vegetatively by fragmentation of the rhizome.

[?] ***Chasmanthe aethiopica*** (L.) N.E.Br. [= *Antholyza aethiopica* L.] (Iridaceae) (southern Africa) — Note: This species is reported in Campania for Naples (Cavara, 1919, sub *A. aethyopica*; De Natale & La Valva, 2000, sub *A. aethiopica*), Capri (Cerio, 1939, sub *A. aethiopica*; Ricciardi, 1998, sub *A. aethiopica*) and Ischia islands (Ricciardi *et al.*, 2004, sub *A. aethiopica*). Several surveyes in the field and in herbaria did not confirm the occurrence of this taxon in Campania. Moreover, already Colasante (2014) did not report it for the region. Probably, most or all the previous indications of *C. aethiopica* are to be referred to other species (see below), as already indicated for some the Italian regions (Galasso *et al.*, 2018a).

[§] ***Chasmanthe bicolor*** (Gasp.) N.E.Br. [= *Antholyza bicolor* Gasp.] (Iridaceae) (southern Africa) — Specimens: Massa Lubrense, loc. Pontone, roadside, 200 m a.s.l., 29 March 2003, *A. Stinca*, det. A. Stinca (PORUN-*Herb. Stinca*); Naples, Bagnoli, ex ItalSider area [33T 430894E 451868N], grassy slopes, 19 m a.s.l., 18 March 2014, *E. Del Guacchio s.n.*, det. E. Del Guacchio (*Herb. E. Del Guacchio*); Altavilla Silentina, contrada Scanno, 33T 505487 E 4487241 N, roadsides, 21 m a.s.l., 25 February 2017, *E. Del Guacchio s.n.*, det. E. Del Guacchio (*Herb. E. Del Guacchio*); Gragnano in loc. Parco Imperiale at the border with Santa Maria la Carità municipality [33T 457989E 4506526N], disused railway line, 42 m a.s.l., 20 March 2019, *A. Stinca*, det. A. Stinca (PORUN-*Herb. Stinca*). Note: First reported by Colasante (2014), who, however, does not cite any precise locality. The plant was cultivated at the Botan-

ical Garden of Naples in the first half of XIX century, but already spread in the region as an ornamental plant, under the misapplied name *Antholyza aethiopica* (Tenore, 1845).

[C+] **Chasmanthe floribunda** (Salisb.) N.E.Br. [= *Antholyza floribunda* Salisb.] (Iridaceae) (southern Africa) — Specimen: Ischia, Ischia Porto, reef nearby the Benthos observatory [33T 4108E 4511N], February 1997, [G.] *Vallariello s.n.*, det. E. Del Guacchio & A. De Natale (*Herb. A. De Natale*, sub *Antholyza aethiopica*). Note: A tuber geophyte, uncommonly cultivated in Campania for ornamental purposes. According to this report, the previous indications of *C. aethiopica* for Ischia Island (Ricciardi *et al.*, 2004) are to be referred at least in part to this taxon.

[?] **Dimorphotheca barberae** Harv. [= *Osteospermum barberae* (Harv.) Norl.] (Asteraceae) (southern Africa) — Note: Del Guacchio & La Valva (2017, sub “*O. barberae* (Harv.) Norl.”) cast some doubts about the record of this plant for the Phlaegrean Fields by Motti & Ricciardi (2005, sub “*Dimorphotheca barberae* Harv.”), actually the only one for Italy (Galasso *et al.*, 2018a). We were not able to locate pertinent specimens at PORUN. In addition, as far as we observed, and in agreement with Cullen (2000), we did not find plants cultivated in the region referable to this taxon.

[C!] **Drosanthemum hispidum** (L.) Schwantes [= *Mesembryanthemum hispidum* L.] (Aizoaceae) (southern Africa) — Specimen: Rutino (Salerno), near the of the exit of the main road “Variante S.S.18” [33T 5103E 4460N], dry roadsides, 70 m a.s.l., 14 May 2014, *E. Del Guacchio* 4866, det. E. Del Guacchio (*Herb. E. Del Guacchio*). Note: Reported in the past for Capri by Cerio (1939), but no longer found (Del Guacchio & La Valva, 2017). Cultivated as an ornamental plant and escaped. A single individual, presumably originated by seeds escaped from cultivated ornamental plants, was found.

[C+] **Ficus rubiginosa** Desf. ex Vent. (Moraceae) (Australia) — Specimen: Salerno, Lungomare Trieste [33T 479749E 4502924N], retaining wall on the seafront, 3 m a.s.l., 17 September 2017, *E. Del Guacchio s.n.*, det. E. Del Guacchio (*Herb. E. Del Guacchio*). Note: A scapose phanerophyte. Recently, very close to the above reported locality, we discovered a single seedling of *F. microcarpa* L.f. (Stinca *et al.*, 2017). Also in this case, the only observed young individual was likely born by ornithochory, and no other plants were observed in the immediate vicinity. The plant is not commonly cultivated in Campania, and it was already known in Italy as casual only for Calabria (Galasso *et al.*, 2018a).

[C+] **Hedera algeriensis** Hibberd (Araliaceae) (Al-

geria, Tunisia) — Specimen: Naples, Bagnoli, ex Ital Sider area [33T 430912E 4518151N], ruins, 10 m a.s.l., 18 November 2013, *E. Del Guacchio s.n.*, det. E. Del Guacchio (*Herb. E. Del Guacchio*). Note: A climbing phanerophyte. The broad-leaved and often variegated ivy cultivars, which are widely cultivated in the region, are mostly to be referred to this species, as already stated for Lombardia by Banfi & Galasso (2010). It can spread vegetatively and by ornithochorous dispersion of seeds. As a spontaneous plant, it was not yet reported for southern Italy (PFI 2019).

[-] **Hedera canariensis** Willd. (Araliaceae) (Canary Islands, Morocco?) — Note: The indication at the regional scale in Celesti-Grapow *et al.* (2009) and Galasso *et al.* (2018a) was based on the indication for Naples by De Natale & La Valva (2000), which is not supported by pertinent samples. According to our observations on the plants cultivated in Campania (Naples included), the previous report is to be probably referred to *H. algeriensis* (cf. the previous note).

[-] **Ipomoea tricolor** Cav. [= *Pharbitis tricolor* (Cav.) Chitt.] (Convolvulaceae) (southern America) — Note: In Campania, *I. tricolor* was reported for Avella, Baiano and Lauro by Moraldo & La Valva (1989, sub “*Pharbitis tricolor* Cav.”). According to our research, supporting specimens are lacking at NAP and field investigations have not confirmed its presence. In our opinion, the previous report is to be very likely referred to *I. purpurea* (L.) Roth, which we found in the same localities but that was not reported by Moraldo & La Valva (1989) (PORUN-*Herb. Stinca*; *Herb. E. Del Guacchio*). Therefore, the presence of this species in Campania, even in the past, is to be regarded as a probable mistake.

[-] **Iris cengialti** Ambrosi ex A.Kern. subsp. **cengialti** [= *I. pallida* subsp. *cengialti* (Ambrosi ex A.Kern.) Foster] (Iridaceae) (endemic to northern Italy) — Note: The record in De Natale & La Valva [2000, sub “*I. pallida* subsp. *cengialti* (Ambrosi) Foster”] is to be referred to *I. pallida* (see the next note), especially on account of the stem up to 60 cm long, the branching of the inflorescence, the leaves robust and long, but without evident lateral veins, and the very pale spathes (Mitić & Pavletić, 1999; Colasante, 2014).

[C+] **Iris pallida** Lam. (Iridaceae) (south-eastern Europe) — Specimen: Naples, via G. Gigante, 8 May 1993, *A. De Natale*, det. E. Del Guacchio & A. De Natale (*Herb. A. De Natale*, sub *I. cengialti* Ambrosi). Note: This iris is sometimes cultivated as ornamental in Campania. The ancient reports for Naples (Tenore, 1824-1829) were already amended by Tenore (1831) himself.



[0] **Jasminum officinale** L. (Oleaceae) (China) — Note: The re-examination of herbarium specimens allow us to attribute the recent indication of *J. officinale* for Campania (Stinca *et al.*, 2012) to another species (see the next note). Accordingly, this latter plant remains to be confirmed (cf. also the generic record in Viegi & Cela Renzoni 1981). *Jasminum officinale* was reported for the provinces of Avellino and Benevento in the past, but pertinent specimens were not located (Del Guacchio & La Valva, 2017).

[It+] **Jasminum polyanthum** Franch. (Oleaceae) (China) — Specimen: Castellammare di Stabia, loc. Privati [33T 457272E 4504373N], anthropized environments, 150 m a.s.l., 7 Aug 2010, *A. Stinca*, det. E. Del Guacchio & *A. Stinca* (PORUN-*Herb. Stinca*, sub *J. officinale* L.). Note: This climbing nanophanerophyte is very common in Campania, where it is cultivated for ornamental purposes and for covering fences. It seldom procudes drupes, but it can easily spread by vegetatively. It does not result escaped in Italy (Galasso *et al.*, 2018a), maybe because somewhere confused with *J. officinale*.

[-] **Kalanchoë daigremontiana** Raym.-Hamet & H.Perrier (Crassulaceae) (Madagascar) — Note: This taxon has been reported for several localities of the province of Salerno (Del Guacchio, 2005) and the Metropolitan City of Naples, including Capri Island (Stinca & Motti, 2009, 2013). Nevertheless, almost surely it is to be excluded from the regional flora. The revision of the specimens on which the literature data were founded, as well as numerous field surveys, indicate that all the spontaneous individuals (and most of the cultivated ones) rather represent a hybrid of it (see the following record).

[N+] **Kalanchoë xhoughtonii** D.B.Ward (Crassulaceae) (horticultural hybrid) — Specimen: Salerno, via Ligea [33T 478583E 4503048N], retaining wall, 15 m, 27 May 2002, *E. Del Guacchio* 3505, det. E. Del Guacchio (*Herb. E. Del Guacchio*). Note: A naturalized neophyte, previously indicated as a casual alien (Stinca *et al.*, 2019a), and confirmed for the province of Salerno. This hybrid between *K. daigremontiana* and *K. delagoensis* Eckl. & Zeyh. [= *K. tubiflora* (Harv.) Raym.-Hamet] has been recently reported for Procida Island (Stinca *et al.*, 2019a). Gallo (2019) reported it, but with a doubt, for Camerota (Salerno province). Also the previous reports for *K. daigremontiana* in Del Guacchio & La Valva (2017) are likely to be referred to this hybrid the hybrid between *K. daigremontiana* and *K. delagoensis* Eckl. & Zeyh. [= *K. tubiflora* (Harv.) Raym.-Hamet] (see the note to *K. daigremontiana*). Moreover, already Del Guacchio (2005) had warned that some of the naturalized plants observed by him

could be referred to this hybrid. Herbarium material was re-examined on the basis of the keys and descriptions by Mesquida *et al.* (2017), and Gallo (2019).

[C+] **Koelreuteria paniculata** Laxm. (Sapindaceae) (China) — Specimen: Naples, Parco Virgiliano [33T 430657E 4516717N], between floor cracks, 153 m a.s.l., 14 August 2018, *A. Stinca*, det. *A. Stinca* (PORUN-*Herb. Stinca*). Note: A scapose phanerophyte, uncommonly cultivated in Campania for ornamental purposes, probably spread by seeds of nearby cultivated plants.

[It+] **Lantana Callowiana Hybrid Group** (Verbenaceae) (horticultural hybrid) — Specimen: Sant'Agello (Naples), Viale dei Pini [33T 448898E 4498337 N], top of concrete wall, 53 m a.s.l., *E. Del Guacchio* & *S. Gargiulo*, 22 August 2018, det. *E. Del Guacchio* (*Herb. E. Del Guacchio*). Note: A nanophanerophyte, increasingly popular as an ornamental plant in Campania, also on account of its drought tolerance. Despite the fact that several hybrids in this group are almost sterile (Hammer 2004), their berries, when produced, are eaten and dispersed by birds. We note that, unfortunately, there is a considerable debate among authors about the naturalized dwarf *Lantana* (e.g., Sanders 1987, Hammer 2004, ALA 2019). Pending further taxonomic studies, we adopt the taxonomic view by the monographer Sanders (2012), who regards them as putatively horticultural hybrid complex between a tetraploid cultivar of *L. depressa* Small var. *depressa* (endemic to Florida) and *L. strigocamara* R.W. Sanders (this latter, in turn, a complex hybrid of cultivated origin: Sanders 2006). Possibly, the rare reports of similar plants for Italy (Apulia, Sicily) (PFI, 2020), under the name *L. depressa*, could indicate *Lantana Callowiana Hybrid Group* as well: a re-examination of the pertinent specimens would be desirable.

[C+] **Leucaena leucocephala** (Lam.) de Wit subsp. **glabrata** (Rose) Zárate [= *L. glabrata* Rose] (Fabaceae) (tropical Americas) — Specimen: Capaccio (Salerno), SP 318, loc. Fontana Ziza (Salerno) [33T 503904E 4477052N], roadside, 35 m a.s.l., *A. Stinca* & *M. Ravo*, 22 August 2017, det. *A. Stinca* (PORUN-*Herb. Stinca*). Note: Scapose phanerophyte probably spread by seeds of nearby cultivated plants. As well as in Sicily (Galasso *et al.*, 2018a), in Italy it has been recently collected in Calabria (Musarella *et al.*, 2020) and Sardinia (Galasso *et al.*, 2019a).

[?] **Lonicera biflora** Desf. (Caprifoliaceae) (western Mediterranean Basin) — Note: As regards the observations about *L. biflora*, *L. caprifolium* L., and *L. japonica* Thunb. by Stinca & Motti (2009) and Stinca *et al.* (2016), we clarify that all the punctual reports of *L.*

*biflora* for the region before 2007 (i.e., Ricciardi, 1998; De Natale & La Valva, 2000; Motti & Ricciardi, 2005) were already referred to *L. japonica* Thunb. by Conti *et al.* (2007), on the basis of personal observations by V. La Valva and E. Del Guacchio. Accordingly, the occurrence of *L. biflora* as spontaneous in Campania is uncertain, and should be verified for Portici (Metropolitan City of Naples) (Stinca & Motti, 2009).

[–] **Lycium chinense** Mill. (Solanaceae) (Asia) — Note: The species was reported by Marcello (1905) as widely naturalized in Italy. He added: “In the Gussone’s herbarium, specimens from Portici, near Naples, can be observed”. This indication was therefore quoted by Del Guacchio (2015a), who, however, annotated: “maybe only cultivated”. For this reason, the taxon has been regarded as doubtfully occurring in Campania by Del Guacchio & La Valva (2017). A closer examination of the specimens collected by Gussone (NAP, Collection “Gussone - Generale”) allows to note that, in the original label of the pertinent specimens collected in Portici (probably at the royal gardens), he wrote “Ubi colitur” (i.e., “where it is cultivated”). For this reason, this taxon had not been cited by Stinca & Motti (2009) and Galasso *et al.* (2018a).

[–] **Najas gracillima** (A. Braun ex Engelm.) Magnus [= *N. indica* (Willd.) Cham. var. *gracillima* A. Braun ex Engelm.] (Hydrocharitaceae) (northern America, Asia). — Note: The only indication for this species in Campania is in Viegi & Cela Renzoni (1981). Being very vague, it was regarded as doubtful by Del Guacchio (2015a). Later, Del Guacchio & La Valva (2017) definitively excluded *N. gracillima* from the exotic flora of Campania, but without explanation. Examining the original work by Viegi & Cela Renzoni (1981), we conclude that, according to their taxonomic treatment, these authors included the native *N. minor* All. and the alien taxa *N. gracillima* and *N. graminea* Delile into a single entry. Therefore, their regional indications for *N. gracillima* cannot be considered.

[C+] **Prunus cerasifera** Ehrh. **Pissardii Group** (Rosaceae) (Eurasia) — Specimen: Naples, viale Merola [33T 444344E 4523255N], pavings, 40 m, 21 April 2016, *E. Del Guacchio s.n.*, det. E. Del Guacchio (*Herb. E. Del Guacchio*). Note: *Prunus cerasifera* is known in Campania almost only within this usually grafted group of cultivars. In cultivation, it is a scapose phanerophyte, abundantly planted in the parks and in rows. The observed individual was born by seed, not far from the mother plant.

[–] **Rapistrum perenne** (L.) All. [= *Myagrimum perenne* L.] (Brassicaceae) (Eurasia) — Note: This species is reported for several localities as a weed and a ruderal

plant, but, in our opinion, its presence in the regional flora needs to be confirmed. The most ancient reports for the provinces of Avellino (Casale & Gussone, 1811, sub *M. perenne*; Tenore, 1820: 66, 395, sub *M. perenne*), Salerno (Gussone & Tenore, 1842, sub *M. perenne*), and Caserta (Terracciano, 1872, sub “*Rapistrum perenne* Desv.”) are erroneous and to be referred to *R. rugosum* (L.) All. (Grande, 1918). This taxon was also reported for Ischia island (G.S.C. de Rivaz in Migliorato, 1914, sub *M. perenne*) and Naples (Terracciano, 1917, sub “*M. perenne* var. *flegreum* [N. Terracc.]”). Note that this latter author already mistakenly indicated *R. perenne* for several localities in southern Italy (Grande, 1918). For the Phlegrean Fields, Migliorato (1914) quotes also an indication by Tenore, which we were not able to locate. Probably on the basis of the old references, the species was generically reported for Campania by Pignatti (1982); while, according to Galasso *et al.* (2018a), it is not confirmed for Campania. However, successive scholars did not ever observe it in the above reported localities, and no *exsiccatum* has been cited (e.g., Motti & Ricciardi, 2005; Ricciardi *et al.*, 2004). Furthermore, we did not find pertinent specimens at NAP. For these reasons, we suggest to exclude *R. perenne* from the flora of Campania.

[It+] **Sedum rubrotinctum** R.T. Clausen (Crassulaceae) (horticultural hybrid) — Specimen: Salerno, below the “Lloyd’s Baia Hotel” [33T 477551 E 4502294 E], maritime cliffs, 50 m a.s.l., 20 June 2005, *E. Del Guacchio & U. Petolicchio s.n.*, det. E. Del Guacchio (*Herb. E. Del Guacchio*). Note: A suffruticose (crassulent) chamaephyte, possibly hybrid between *S. stablii* Solms and *S. pachyphyllum* Rose, both native to Mexico (USDA-ARS, 2018), and identified following Groenendijk-Wilders & Springate (2011). It is often cultivated for ornamental purposes, but seldom flowering outdoor. In the reported locality, it probably arrived by vegetative propagules.

[–] **Senecio squalidus** L. subsp. **aethnensis** (Jan ex DC.) Greuter [= *S. aethnensis* Jan ex DC.] (Asteraceae) (Sicily) — Note: see the next note.

[N!] **Senecio squalidus** L. subsp. **chrysanthemifolius** (Poir.) Greuter [= *S. chrysanthemifolius* Poir.] (Asteraceae) (endemic to southern Italy and Sicily) — Note: This taxon established on Vesuvius (Metropolitan City of Naples) after the reforestation works employing *Genista etnensis* (Raf.) DC. (Agostini, 1959, sub *S. squalidus* L. var. *chrysanthemifolius* [Poir.] Fiori). It was later confirmed but reported as *S. aethnensis* Jan ex DC. by Ricciardi *et al.* (1988), who cited *S. chrysanthemifolius* as a synonym. Accordingly, Bartolucci *et al.* (2018), reported in Campania only *S. squalidus* subsp. *aethnensis*. This latter subspecies is endemic

to the high zone of Mount Etna and does not occur either in Calabria (Bartolucci *et al.*, 2018), or in Campania.

**[+C] *Tradescantia pallida*** (Rose) D.R.Hunt [= *Setcreasea pallida* Rose] (Commelinaceae) (Mexico) — Specimens: Caserta, centro [33T 443896E 4546401N], tuff wall, 64 m a.s.l., 22 February 2019, A. Stinca, det. A. Stinca (PORUN-Herb. *Stinca*); Capri, Marina Piccola [33T 434966E 4488013N], grassy slopes along the road, 87 m a.s.l., 27 May 2019, E. Del Guacchio & F. Napolitano s.n., det. E. Del Guacchio (Herb. E. Del Guacchio). Observations: Salerno, via Paolo De Granita, [33T 480552E 4503429N], concrete pavings in courtyards, 30 m a.s.l., 19 November 2017. Note: This suffruticose chamaephyte is very popular as an ornamental in Campania, and it easily escapes spreading by vegetative fragments, often transported by the wind or dumped by man.

**[C+] *Tetrapanax papyrifer*** (Hook.) K.Koch [= *Aralia papyrifera* Hook.] (Araliaceae) (eastern Asia) — Specimen: Sant'Antonio Abate (Naples), along the SP 122 at the boundary with Anagni [33T 462202E 4508698N], between floor cracks, 22 m a.s.l., 31 August 2017, A. Stinca, det. A. Stinca (PORUN-Herb. *Stinca*). Note: A nano-phanerophyte, cultivated in Campania for ornamental purposes, probably spread by seeds or rhizomes of nearby cultivated plants. For the region, a previous record exists (Cavara 1919, sub *Aralia papyrifera* Hook.), but it refers to plant become spontaneous inside the Botanical Garden of Naples (Del Guacchio & La Valva 2017). In Italy, it has been recorded as a casual only in Tuscany (Marchetti 2011).

**[-] *Viola cornuta*** L. (Violaceae) (western Europe) — Note: The indication in Galasso *et al.* (2018a) is fully based on Stinca *et al.* (2012), but actually these latter authors clearly stated that “the collected individuals can be referred to the complex of hybrids of *V. cornuta*”, i.e. *V. williamsii* Wittr. (but see the next note).

**[It-] *Viola williamsii*** Wittr. (Violaceae) (hybrid origin between *V. cornuta* L. × *V. wittrockiana* Gams ex Nauenb. & Buttler) — Note: The specimens reported by Stinca *et al.* (2012) actually belong to modern cultivars of *V. tricolor* L. subsp. *tricolor* or to *V. arvensis* Murray subsp. *arvensis* (Walters 2011; Marcussen *et al.*, 2010). These cultivars are often traded under the erroneous name *V. cornuta* hybrids, but both *V. cornuta* and *V. williamsii* are unusually cultivated in Campania: they can be distinguished by the perennial habit and the longer spur (Marcussen *et al.*, 2010).

## DISCUSSION

The main part of the newly reported species has been deliberately introduced into Campania for ornamental uses. This subset of alien species is the most numerous among the casual or naturalized taxa (Del Guacchio & La Valva, 2017). Fourteen casual taxa resulted new for the region, while another one is confirmed. It is to be noted that *Acalypha supera*, *Begonia Semperflorens* Cultorum Group, *Canna ×generalis*, *Jasminum polyanthum*, *Lantana Callowiana* Hybrid Group, and *Sedum rubrotinctum* are new to Italy, while *Hedera algeriensis* is new for the southern Italian peninsula. In addition, the widely established *Chasmanthe bicolor* and *Kalanchoë ×houghtonii* are to be listed among the naturalized taxa. The former was reported only generically for the region by Colasante (2014): actually, it has been often confused with *Chasmanthe aethiopica*, which, on the contrary, doubtfully occurs in the region. *Kalanchoë ×houghtonii* has been widely confused with one of its parents, i.e. *K. daigremontiana*. On the contrary, *Senecio squalidus* subsp. *chrysanthemifolius*, neglected in the recent checklists, was reported in literature as locally naturalized (even if not recorded after 1988). Besides, in the absence of herbarium specimens, and after various considerations, the occurrence of 3 taxa reported in literature is to be regarded at least as very doubtful, even in the past. Some of them appear only in ancient works and often only once. Nevertheless, some of them are reported in recent contributions. In addition, other 13 taxa are to be excluded by now from the alien regional flora (*Viola williamsii* from the flora of Italy); one of them, i.e. *Jasminum officinale*, is to be regarded as a not confirmed taxon.

The results of the present contribution highlight the importance to document floristic records by herbarium specimens. In fact, especially in the case of exotic plants, and even more for those deliberately introduced, it is quite impossible to ascertain the occurrence of a taxon only occasionally becoming spontaneous. This is clearly due to several factors. Alien plants (the casual ones as a rule, but sometimes also the naturalized ones) are typically ephemeral or inconstant, so they often cannot be found again *in loco* for further examination. Besides, a rigorous identification of allochthonous taxa might reveal a delicate question, especially if similar or very similar species are massively introduced by confusing names (e.g., into gardens). In addition, biogeographical data, normally very useful to locate out-of-range reports (and therefore suspicious indications), cannot be reliably employed for introduced taxa. In addition, it is necessary to consider the many specimens of alien taxa were prepared collecting cultivated individuals, and this information often is lacking on the label, or neglected by scholars (e.g., *Lycium chinense*).

Most of these doubtful or erroneous records were not treated in almost any checklists (e.g., Viegi *et al.*, 1974; Celesti-Grapow *et al.* 2009, 2010; Galasso *et al.*, 2018a). In some cases, they were provisionally excluded or reported as doubtful by Del Guacchio & La Valva (2017), but without a detailed explanation.

#### ACKNOWLEDGEMENTS

We thank the anonymous reviewers for their very accurate and useful suggestions, which much improved the manuscript.

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(ms. pres. 5 ottobre 2019; ult. bozze 15 dicembre 2020)

Edizioni ETS

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Finito di stampare nel mese di dicembre 2020