Article

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G. Calvia, M. Fois, F. Mascia, L. Podda, M. Manca, G. Bertotto, G. Campus, A. Lallai, A. Ruggero, M. Porceddu, G. Rivieccio, A. Cuena-Lombraña, S. Bagella, E. Farris & G. Bacchetta

Contribution to a new vascular flora of Sardinia (Italy): III (61-90)

Abstract

Calvia, G., Fois, M., Mascia, F., Podda, L., Manca, M., Bertotto, G., Campus, G., Lallai, A., Ruggero, A., Porceddu, M., Rivieccio, G., Cuena-Lombraña, A., Bagella, S., Farris, E. & Bacchetta, G.: Contribution to a new vascular flora of Sardinia (Italy): III (61-90). — Fl. Medit. 36: 63-98. 2026. — ISSN: 1120-4052 printed, 2240-4538 online.

Following the first two contributions for a new, updated, and revised vascular flora of Sardinia, new data about the distribution of 30 taxa growing in the island are here presented. Taxa are both native and alien, and are characterized by their very low frequency, phytogeographical significance, endemicity, conservation status, invasiveness or novelty to Sardinia and Italy. The results derive from floristic research carried out throughout Sardinia and various neighbouring islands and islets. The first reports of *Bulbine frutescens*, *Coleus barbatus*, *Dasylirion serratifolium*, *Euphorbia ingens*, and *E. milii* are here recorded for the first time in Italy (casual alien). Additionally, *Ageratum conyzoides*, *Cyperus papyrus*, *Erysimum odoratum*, *Galinsoga quadriradiata*, and *Narcissus* trumpet daffodil group (casual alien taxa) are documented here for the first time in Sardinia. Moreover, the confirmations for Sardinian flora of *Carex acutiformis*, *Catananche lutea*, and *Suaeda splendens* are here provided after 40 years without new reports. New distributional data for 12 taxa, most of which known for their rarity, are gathered. Notably, *Callitriche lusitanica* was previously reported only for a few sites. Concerning other taxa, a clarification of their distribution range on the island is documented, as for the rare *Ceratophyllum submersum* subsp. *submersum, Limoniastrum monopetalum,* and *Malva stenopetala* subsp. *plazzae*, which have recently faced contraction after human activities on their previously known locations. New data are also provided for some rare endemics, including *Romulea revelierei, Silene velutina*, and *Stachys salisii*. New findings are also reported for *Cachrys libanotis*, *Chamaerops humilis*, *Damasonium bourgaei*, *Linum tenuifolium*, *Monotropa hypopitys* (rare to scattered native). In addition, updated information on the distribution of *Arctotheca calendula*, *Delairea odorata*, *Gazania ×splendens*, *Kalanchoe ×houghtonii*, and *Tropaeolum majus* (invasive alien taxa) is here reported. Finally, new data about some of the taxa recorded in the first two contributions are added below.

Key words: Alien taxa, Endemic taxa, Mediterranean vascular flora, Native taxa, Rare Plants.

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Introduction

This third contribution represents a continuation of the previous works devoted to update vascular plant flora of Sardinia (Ruggero & al. 2024; Calvia & al. 2025). Although the distribution of vascular plants in this region is generally well known, thanks to several hundreds of articles published in recent decades and to the comprehensive synthesis provided by Arrigoni (2006-2015), various areas of the island are still poorly explored and they are checked just in recent years. As a result, new findings continue to emerge, extending the known ranges of various taxa at the regional scale. These new records are often located far from the previously known localities of a given species, thereby considerably improving our understanding of their distribution patterns. Moreover, the continuous introduction of new taxa for different purposes, mostly gardening, is generating an unprecedented spread of alien taxa that seems uncontrollable (Clements & al. 2022).

Through extensive field surveys conducted across Sardinia, as well as taxonomic revisions of herbarium specimens (several vascular plant groups), we have identified a number of taxa that are new to the flora of Sardinia and, in some cases, to Italy as a whole. In this third report, we present records of 30 vascular plant taxa from the island and its neighbouring islands and islets. These findings are significant for refining current knowledge on the distribution, endemism, and invasive status of these taxa.

Material and methods

This study is based on extensive plant collections carried out in Sardinia and the surrounding islands and islets between 1997 and March 2026. Complementing this long-term field research, undertaken over several years and still ongoing, was the examination of herbarium specimens and a thorough review of the relevant literature. Additional records retrieved from online platforms such as Wikiplantbase Sardegna (Bagella et al. 2015-), iNaturalist (iNaturalist 2026), GBIF (Global Biodiversity Information Facility 2026), and various floristic pages on Facebook were also taken into consideration.

Specimens were identified using major Italian and European floras (Tutin & al. 1964-1980, 1993; Pignatti 1982; Castroviejo & al. 1986-2015; Arrigoni 2006-2015; Jeanmonod & Gamisans 2013; Tison & De Foucault 2014; Pignatti & al. 2017-2019). The status of each alien species was defined according to the criteria proposed by Richardson & al. (2000), refined by Pyšek & al. (2004), and reviewed following Richardson & al. (2011). The taxonomic sequence follows Pignatti & al. (2017-2019), while nomenclature adheres to Bartolucci & al. (2024) and Galasso & al. (2024).

Specimens are deposited in the personal herbaria of some of the authors (e.g. Herbarium Ruggero, Herb. Calvia, Herb. Mascia, Herb. Farris) as well as in institutional collections (CAG and SS herbaria). Herbarium acronyms follow Thiers (2026 [continuously updated]).

The taxa are presented in two separate groups, i.e. native and alien, each one arranged alphabetically per genus and species ranks. Information regarding *ex situ* conservation actions undertaken for native taxa at the Sardinian Germplasm Bank (BG-SAR; Porceddu & al. 2017) is also provided.

New findings for each taxon are reported as follows: Municipality of the finding and administrative province in brackets; locality and coordinates of the finding; habitat and elevation; date; author(s) of the finding; herbarium name if a sample has been collected. Where no herbarium is mentioned (because of the species rarity or for other technical issues) the finding was documented by pictures or living specimens deriving from those localities are preserved in private collections.

Concerning the administrative province codes, following the implementation of Sardinian Regional Law no. 7/2021, effective from 1st June 2025, two new metropolitan cities were established, Cagliari (CA) and Sassari (SS), alongside six administrative provinces: Olbia-Tempio (OT), Nuoro (NU), Oristano (OR), Medio Campidano (VS), Ogliastra (OG), and Sulcis-Iglesiente (SU).

Finally, we include recent records, observed during the past year, concerning some taxa already treated in our previous contributions (Ruggero & al. 2024; Calvia & al. 2025).

Results and discussion

During this research, we deepened the knowledge about 30 different taxa growing in Sardinia. Specifically, fifteen taxa are native elements of the Sardinian flora, five of which are endemic to Sardinia, and sometimes to other islands and regions within the Tyrrhenian area, while the others can be regarded as regionally rare or threatened and of phytogeographical significance (Table 1). In addition, ten of the reported taxa are casual aliens newly recorded for the study area, four of which are also new to Italy. Five futher taxa, previously considered naturalized aliens, have been reclassified as invasive based on recent evidence (Table 2)

Native taxa

Cachrys libanotis L. (*Apiaceae*)

Distribution update

New findings: Castelsardo (SS) Lu Bagnu (40.906555°N, 8.690362°E), coastal scrublands, 50 m a.s.l., 10/08/2023, *M. Fois, A. Cuena-Lombraña* (CAG); Golfo Aranci (OT) Punta Filasca (40.985395°N, 9.652550°E), scrublands, 41 m a.s.l., 06/09/2024, *G. Bacchetta, M. Manconi*.

Observations: This taxon is native to the western Mediterranean and is distributed in Albania, Algeria, Italy, Morocco, Portugal, Sardinia, Sicily, Spain, and Tunisia (POWO 2026). In Italy, it is reported in all southern regions and on the main islands of Sicily and Sardinia (Bartolucci & al. 2024). Arrigoni (2013) reported its presence in Sardinia as doubtful, considering it as probably confused with *C. dichotoma* (Desf.) Spr., a species not even reported by Bartolucci & al. (2024), neither as a synonym of any taxon. Regarding the latter species, Arrigoni recorded its occurrence near Arborea (OR), Masua (Iglesias, SU), and Terralba (OR). Some specimens preserved in the herbarium SS (reported by Wikiplantbase Sardegna) indicate the occurrence of *C. libanotis* for the beaches of Mugoni (Alghero, SS) and Porto Ferro (Sassari). Here we

Table 1. Native taxa reported in this study, with information about their family, chorology, and rarity (very rare = less than 10 growing stations known in Sardinia; rare = 10 to 50 growing stations known in Sardinia; Scattered = more than 50 growing stations known in Sardinia but with important gaps across the territory; * = a taxon that has faced/is facing local decrease due to human activities in recent years).

Taxon	Family	Chorology	Rarity in Sardinia
Cachrys libanotis L.	*Apiaceae*	W-Medit.	Very rare
Callitriche lusitanica Schotsman	*Callitrichaceae*	Steno-Medit.	Very rare
Carex acutiformis Ehrh.	*Cyperaceae*	Euras.	Very rare
Catananche lutea L.	*Asteraceae*	S-Medit.	Very rare
Ceratophyllum submersum L.	*Ceratophyllaceae*	Afr. Trop.	Very rare*
Chamaerops humilis L.	*Arecaceae*	C-W Medit.	Scattered*
Damasonium bourgaei Coss.	*Alismataceae*	Medit. Atl.	Rare*
Limoniastrum monopetalum (L.) Boiss.	*Plumbaginaceae*	Steno-Medit.	Very rare*
Linum tenuifolium L.	*Linaceae*	Submedit.	Rare
Malva stenopetala subsp. *plazzae* (Atzei) Iamonico, Bartolucci & Peruzzi	*Malvaceae*	Endem Sa	Rare*
Monotropa hypopitys L.	*Ericaceae*	Circumbor.	Rare
Romulea revelierei Jord. & Fourr.	*Iridaceae*	Endem. Sa Co	Rare*
Silene velutina Pourr. ex Loisel.	*Caryophyllaceae*	Endem. Sa Co	Rare*
Stachys salisii Jord. & Fourr.	*Lamiaceae*	Endem. Sa Co AT	Scattered
Suaeda splendens (Pourr.) Gren & Godr.	*Amaranthaceae*	Steno-Medit.	Very rare*

confirm its presence and extend its regional distribution by reporting a new small population near Castelsardo (SS) (Fig. 1).

Rarity and threats: The species is rather uncommon in Sardinia although the entire group is usually neglected and considered as problematic from the taxonomic standpoint (Ferrer-Gallego & Alos 2021). The genus is of phytochemical interest, and *C. libanotis* in particular has traditionally been used in the treatment of rheumatism due to its high concentration of antioxidant compounds (Musolino & al. 2023 and references therein). A potential threat could therefore be linked to the harvesting of this plant in nature. Further field investigations are otherwise needed to improve knowledge of its actual distribution and population consistence.

Table 2. Alien taxa reported in this study, with information about their family, chorology, and invasive status (CAS = casual in Sardinia; INV = invasive in Sardinia; * = taxon new to the alien flora of Sardinia).

Taxon	Family	Chorology	Status
Ageratum conyzoides L.	*Asteraceae*	C-Amer.	CAS*
Arctotheca calendula (L.) Levyns	*Asteraceae*	S-Afr.	INV
Bulbine frutescens (L.) Willd.	*Asphodelaceae*	Paleotrop.	CAS*
Coleus barbatus (Andrews) Benth ex G.Don	*Lamiaceae*	S-Medit.	CAS*
Cyperus papyrus L.	*Cyperaceae*	Afr. Trop.	CAS*
Dasylirion serratifolium (Karw. ex Sculth. & Schult.f.) Zucc.	*Asparagaceae*	Mexic.	CAS*
Delairea odorata Lem.	*Asteraceae*	S-Afr.	INV
Erysimum odoratum Ehrh.	*Brassicaceae*	C-Europ.	CAS*
Euphorbia ingens E.Mey ex Boiss.	*Euphorbiaceae*	C-Afr.	CAS*
Euphorbia milii Des Moul.	*Euphorbiaceae*	Madagasc.	CAS*
Galinsoga quadriradiata Ruiz & Pav.	*Asteraceae*	C-S-Amer.	CAS*
Gazania × *splendens* Hend. & Andr.Hend.	*Asteraceae*	Afr.	INV
Kalanchoe × *houghtonii* D.B.Ward	*Crassulaceae*	USA	INV
Narcissus trumpet daffodil group	*Amaryllidaceae*	Cultivar	CAS*
Tropaeolum majus L.	*Tropaeolaceae*	S-Amer.	INV

Callitriche lusitanica Schotsman (*Callitrichaceae*)

Distribution update

New finding: Domus de Maria (CA) Porto de Su Scovargiu (38.9131°N, 8.9077°E), in some temporary pools, 1-15 m a.s.l., 20/10/2025, *M. Fois, A. Cuena-Lombraña*.

Observations: *Callitriche lusitanica* is widespread from the Iberian Peninsula to most of northern Africa (Algeria, Morocco, Tunisia), Israel, Syria, Lesvos and Sicily (Lansdown & al. 2017). In Sardinia, *C. lusitanica* was reported at Rio Ollastu (San Vito, CA), Rio Picocca (San Vito), Fiume Temo (Bosa, OR) and Riu Campu Oes (Villanova Monteleone, SS; Lansdown & al. 2017). We recently found it near Domus de Maria (CA) in a stream near the coast, extending its distribution to the South-West of the Island (Fig. 1).

Rarity and threats: *C. lusitanica* has been classified as LC globally (Lansdown & al. 2017), while in Sardinia it is considered rare. Considering the large Wallacean gaps

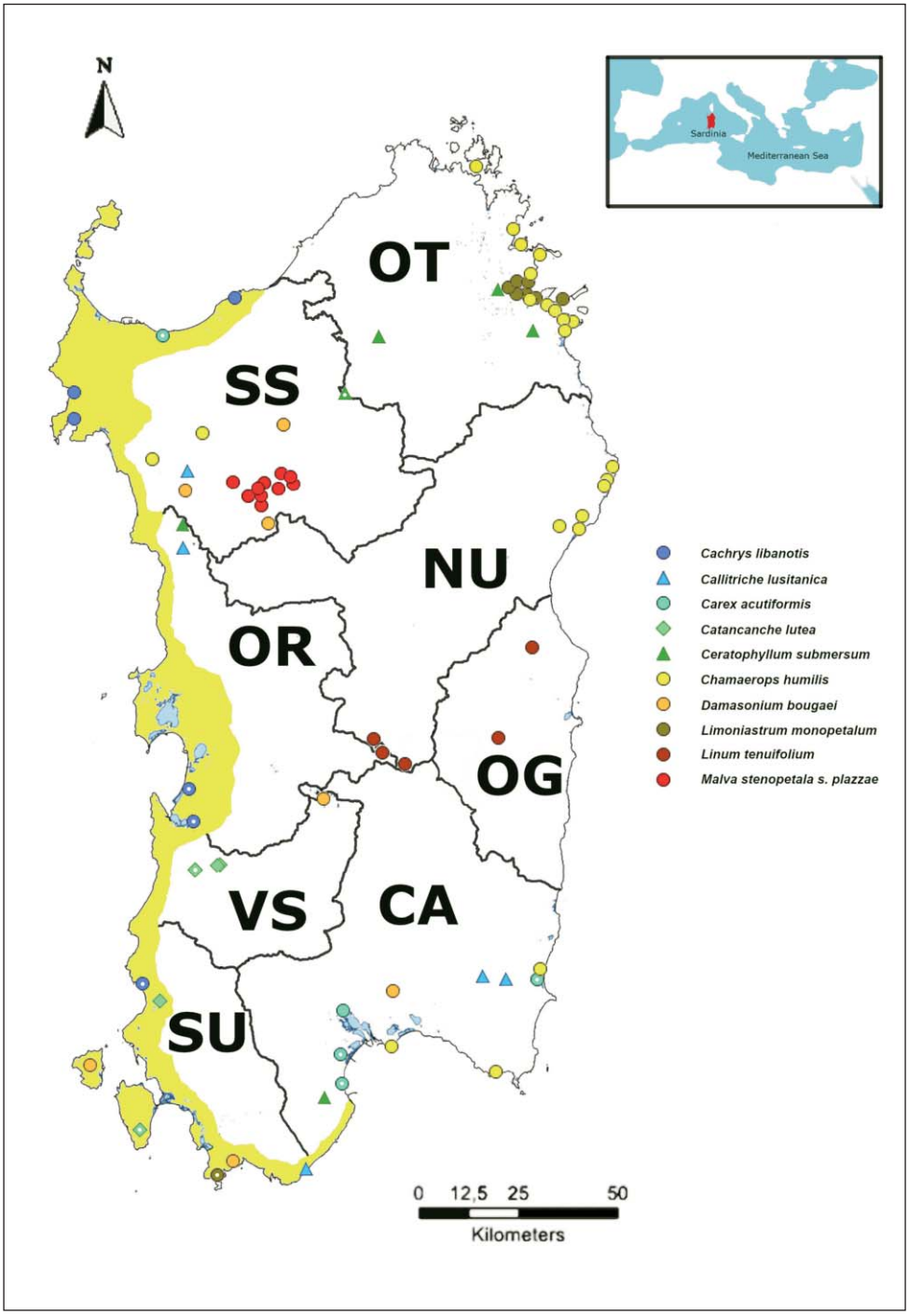

Fig. 1: Distribution map of ten native taxa cited in this article. Pointed symbols refer to not confirmed data.

relating to the entire genus, it is likely that its distribution is wider both in the Mediterranean and in Sardinia. Further research is therefore needed to verify the actual distribution and any threats to the species.

Carex acutiformis Ehrh. (*Cyperaceae*)

Distribution update and clarification

New findings: Assemini (CA) San Genesio (39.261125°N, 8.991292°E), wetlands along the road to Macchiareddu near Foce Mereu, 1 m a.s.l., 21/02/2009, *F. Mascia* (Herb. Mascia), 16/03/2025, *G. Calvia* (Herb. Calvia).

Observations: This Eurasian species is considered common in northern Italy, while becomes rarer in central and southern regions and in the islands (Pignatti & al. 2017-2019). In Sardinia it was first reported by Moris (1827) at Orri (Sarroch, CA). Further records became from Muravera (CA, an herbarium specimen collected by Nicotra in 1896 and preserved in CAG), Tanca di Nissa (Capoterra, CA; Martelli 1896-1904), and lastly from Platamona (Sassari; Giau 1986). However, none of the mentioned localities was recently confirmed during the last 40 years, while Desfayes (2008) and Arrigoni (2015) did not add new records. We recently found it near Assemini (CA), at the margins of a vast wetland close to the Santa Gilla Lagoon, mixed with other helophytes along a road (Fig. 1).

Rarity and threats: This species appears to be very rare in Sardinia, where it seems to be concentrated in a few coastal and lowland areas. In these habitats, it is sometimes exposed to human activities such as expansion of tourist settlements, environmental modifications, wetland reclamation, channelization, and drainage. *In situ* and *ex situ* conservation efforts are needed to address these concerns.

Catananche lutea L. (*Asteraceae*)

Distribution update

New findings: Guspini (VS) Genna Carboni (39.600784°N, 8.625673°E), therophytic xerophilous grasslands on volcanic substrates, 132 m a.s.l., 25/05/2025, *F. Mascia* (SIENA); Guspini (VS) Saurecci (39.602840°N, 8.626766°E), therophytic xerophilous grasslands on volcanic substrates, 109 m a.s.l., 25/05/2025, *F. Mascia* (Herb. Mascia); Gonnesa (SU) Campu Pirastu (39.297025°N, 8.472504°E), therophytic xerophilous grasslands forming mosaic with silicicolous garrigue vegetation, 202 m a.s.l., 23/05/2025, *F. Mascia* (Herb. Mascia).

Observations: Therophyte distributed in southern Mediterranean Basin. In Italy, it is known from most of the central-southern and Tyrrhenian regions, including Sardinia (Bartolucci & al. 2024; Pignatti & al. 2017-2019). On the island, the species is considered very rare (Arrigoni 2006), with only two historical records, both from southwestern sectors, specifically from Monte Arcuentu (Picci 1970) and from the island of Sant'Antioco (SU; Milia & Mossa 1977), for which no recent confirmations are available (Mossa & al. 2003; Bacchetta & al. 2007). Here, we add new information and slightly expand its distribution area (Fig. 1).

Rarity and threats: The rediscovery of the species in two localities in Sardinia represents a confirmation of its presence on the island after nearly 50 years without new data. Although rare and probably restricted to the Sulcitano-Iglesiente sector, the taxon may

be more widespread than previously documented within thermo-xerophilous grasslands of the thermo-Mediterranean bioclimatic context referable to the class *Stipo-Trachynietea distachyae* S. Brullo in S. Brullo et al. 2001, as well as within perennial grasslands of the alliance *Hyparrhenion hirtae* Br.-Bl., P. Silva & Rozeira 1956.

Ceratophyllum submersum L. subsp. ***submersum*** (*Ceratophyllaceae*)

Distribution update

New findings: Berchidda (OT) Rio Carasu in loc. Sa Multa 'Ona (40.788890°N, 9.103869°E), permanent pools of the stream from 250 to 300 m a.s.l., 31/10/2010, *G. Calvia* (Herb. Calvia); Loiri-Porto San Paolo (OT) loc. Lu Lignamu (40.829087°N, 9.561515°E), pond along the streamlet Lu Pisciaroni, left tributary of Riu Rischiddu, before it flows within Rio Su Lernu, 63 m a.s.l., 01/04/2024, *leg. G. Bertotto, det. G. Calvia*; Sarroch (CA) Monti Nieddu Dam (39.067937°N, 8.960546°E), 76 m a.s.l., 04/06/2025 *M. Fois, A. Dalla Vecchia, R. Bolpagni*; Bosa (OR) Riu Sa Entale (40.400848°N, 8.529906°E), 180 m a.s.l., 06/06/2025 *M. Fois, F. Alamanni, A. Cuena-Lombraña, A. Dalla Vecchia, R. Bolpagni*.

Observations: This subcosmopolitan strictly aquatic species is reported in Italy from all regions, islands included (Bartolucci & al. 2024). The first record in Sardinia was by Arrigoni (2006), who found it in wetlands within the plain between Oschiri (OT) and Chilivani (Ozieri, SS). Unfortunately, those precious areas, representing some of the last wetlands on the Ozieri plain and rich in endemic and rare taxa, were almost totally destroyed during the works for the creation of the new road 729 Sassari-Olbia. This led to the eradication, among others, of all the plants belonging to this species that occurred there. Later, Desfayes (2008) did not find any new locality, while abundantly enlarging the knowledge on the distribution of *C. demersum* L. (which is quite common across the island). Then, the species was reported from Mount Limbara, where it thrives in a single small stream of its southern slope, from 200 to 400 m a.s.l. (Calvia & Ruggero 2020). More recently, a site near Olbia (OT) has been reported by Rivieccio & al. (2024). Further findings were recently done in north-eastern Sardinia, on a coastal wetland near Porto Rotondo (Olbia) and along small streams in the municipalities of Loiri-Porto San Paolo and Olbia. The species also occurs in the north-western part, along Rio Sa Entale (Bosa) and on a small basin in South Sardinia, at Monti Nieddu (Sarroch, CA) (Fig. 1).

Rarity and threats: The species appears to be very rare on the island, and limited to a few sites, some of which have already been altered irreversibly by human activities such as channelization and transformation. As an example, the construction of an artificial barrier is currently underway along Riu Monti Nieddu, probably leading to a future disappearance of the species from some stretches of that stream. Therefore, *in situ* and *ex situ* conservation efforts are needed to address these concerns.

Chamaerops humilis L. subsp. ***humilis*** (*Arecaceae*)

Distribution update

New findings: Olbia (OT) Pittulongu (40.935300°N, 9.568611°E), dune system, 1 m a.s.l., 25/07/2024, *G. Bertotto*; Muravera (CA) Colostrai Beach (39.363355°N, 9.598745°E), dunes, near the huge *Juniperus macrocarpa* Sm., 1 m a.s.l., 05/02/2025, *G. Calvia, S. Macis*; La Maddalena (OT) S. Stefano Island, near Spiaggia del Pesce (41.195601°N,

9.399144°E), on barren soil close to the beach, bordering the scrublands, 19/03/2025, *det A. Ruggero, leg. A. Di Giacomo*; Olbia (OT), Lido del Sole (40.914957°N, 9.562040°E), scrublands, 9 m a.s.l., 29/10/2025, *G. Bertotto*; San Teodoro (OT) Punta Molara (40.84699°N, 9.67326°E), scrublands, 43 m a.s.l., 01/11/2025, *G. Bertotto*; San Teodoro (OT), Cala Ginepro (40.85143°N, 9.68955°E), coastal scrublands, 2-10 m a.s.l., 01/11/2025, *G. Bertotto*; San Teodoro (OT), along SS125 (40.8092778°N, 9.65826°E), road edge, 5 m a.s.l., 12/08/2025, *E. Farris*; Loiri-Porto San Paolo (OT) loc. Porto Taverna c/o Via del Mare (40.85354°N, 9.65485°E), scrubland near the pond, 5 m a.s.l., 01/11/2025, *G. Bertotto*; Villasimius (CA), Capo Boi (39.128533°N, 9.441967°E), coastal scrublands, 99 m a.s.l., 30/10/2022, *L. Podda*.

Observations: This species has a distribution limited to the central-western Mediterranean Basin. In Italy, it mostly occurs in the Tyrrhenian regions, and in the islands (Bartolucci & al. 2024). In Sardinia, it was first recorded by Moris (1827) from Sant'Antioco and Orosei (NU), then it was reported in many areas of the island, mostly in the western half (Arrigoni 2015). In the eastern part of Sardinia, a limited number of sites was known in a few coastal and lowland areas such as Santa Maria Navarrese (Baunei, OG), Monte Tuttavista, Orosei, near Nuraghe Muriè and near Cala Liberotto (Herzog 1909; Martinoli & Piroddi 1956). However, the species also occurs in eastern Gallura, from the coasts of Arzachena (OT) to San Teodoro (OT), in other coastal areas of Siniscola (NU) and Orosei (NU), particularly near Berchida Beach (Siniscola) and the adjacent Bidderosa area. Before afforestation projects, the species had been widely harvested for the production of plant fibre. Further South, the species occurs along the basaltic coastline from Cala 'e Su Zegu up to the locality of Foche Pizzinna (Orosei). Interesting stations are also present in some coastal areas of Sarrabus (Fig. 1). We also found plants of doubtful (Muravera; Quartu Sant'Elena, CA; Solanas and Torre delle Stelle in the municipality of Maracalagonis, CA), to certainly subspontaneous origin, mostly generated from cultivated specimens. These latter plants were observed inland, near Nostra Signora di Castro and near the cemetery of Oschiri, and in coastal areas (La Maddalena, OT; Stabulario di Santa Gilla, Assemini; etc.).

Rarity and threats: The species is rather common in several sectors of Sardinia, in particular those on the western coast, while elsewhere is very rare. We can hypothesize that its former distribution in Sardinia may have been larger, involving also lowland inner areas, where it is quite frequent the presence of old toponyms referring to palms. This ancient presence is also deductible from the numerous uses that are attested in all Sardinian sectors (Atzei 2003). This disappearance can be interpreted as the result of several modifications and human actions in the long term, such as wildfires, and habitat fragmentation, but also over-exploitation. As a consequence, today, apart from the certainly natural populations historically known from Castelsardo westwards to Nurra, Planargia, Oristanese, Arburese, Iglesiente, Sulcis, and hills surrounding Cagliari, smaller islands (e.g. Asinara, San Pietro, Sant'Antioco) included, in other parts of Sardinia the species appears more rarely and is not always considerable of native origin. But for those eastern populations that can be evaluated as native, the risk related to wildfires, with impossibility to regenerate, is constant pressure. Furthermore, the occurrence of cultivated plants in tourist settlements, of uncertain origin and potentially contaminating the genetic integrity of these populations represents a threat since their isolation

could have selected specific characteristics that are at risk of genetic pollution. Finally, a considerable threat can be related to the diffusion of the invasive alien insect species *Rhynchophorus ferrugineus*, a palm parasite that is increasingly attacking this species (Cocco & al. 2019). A single germplasm accession, comprising 268 seeds collected at Capo Sant'Elia (Cagliari) in 2022, is preserved at BG-SAR.

Damasonium bourgaei Coss. (*Alismataceae*)

Distribution update

New findings: Serdiana (CA) endorheic pond of Su Staixeddu (39.342971°N, 9.123445°E), wet meadows, 98 m a.s.l., 16/05/2022, *G. Calvia, A. Lallai* (Herb. Calvia).

Observations: This species differs from the similar *D. alisma* Mill. for its biological form (always annual), the length of its floral peduncles (8-15 mm *versus* 2-3 cm), which are sub-equal to the carpels (*versus* consistently longer; Pignatti & al. 2017-2019). In Italy, this taxon is native to Apulia, Basilicata, Sardinia, and Sicily (Bartolucci & al. 2024). The first record in Sardinia was from Martinoli (1950), who found it at Capo Sant'Elia (Cagliari). Later, Rich & Nicholls-Vuille (2001) confirmed its presence for the island. Subsequently, Bartolucci & al. (2018) considered this species in Sardinia as naturalized alien, then emended by Bartolucci & al. (2019). Some herbarium specimens exist at the Herbarium of Cagliari (CAG): 2009 at Cava Monte Pira, Bonorva (SS) (Leg. F. Mascia); 2014 at Badde Pirastu (Teulada, SU). In a recent article, the species appears in some phytosociological relevés from San Pietro Island (SU), Monte Minerva (Villanova Monteleone, SS), near Ardara (SS), and Giara of Gesturi (VS, Brullo & al. 2025). In later years, we found other populations in South Sardinia (Fig. 1), one of which, near Serdiana (CA), was vast when we observed it in May 2022 but subsequently suffered an intervention of ploughing that partly disrupted the area.

Rarity and threats: The species is quite rare and some of the habitats it occupies are threatened by human activities such as water reclamation, agricultural works and drainage. Moreover, extreme droughts can compromise its phenology in certain areas and seasons. Therefore, *in situ* and *ex situ* conservation efforts are needed to address these concerns. BG-SAR preserves one germplasm accession (400 seeds), collected in 2023 at Capo Sant'Elia (Cagliari), at -25°C.

Limoniastrum monopetalum (L.) Boiss. (*Plumbaginaceae*)

Distribution update

New findings: Olbia (OT) Cala Saccaia (40.924515°N, 9.562962°E), along the coast from the end of the shipyard to the pond, 0-2 m a.s.l., 24/04/2011, *G. Calvia* (Herb. Calvia); Olbia (OT) Via dei Lidi (40.929703°N, 9.507055°E) remnants of coastal vegetation, 1 m a.s.l., 07/12/2025, *G. Bertotto*; Olbia (OT) Industrial area (40.933463°N, 9.524283°E), coastal vegetation West of Rio Padredduri mouth, 0-1 m a.s.l., 28/12/2025, *G. Bertotto*.

Observations: This Mediterranean species occurs, in Italy, in Apulia, Calabria, Sardinia, and Sicily (Bartolucci & al. 2024). In Sardinia, it was known with native populations only in the coastal areas South of Olbia (Arrigoni 2010). Indeed, it is particularly widespread from the eastern outskirts of Olbia (Mogadiscio neighbourhood), along the coast

over the mouth of Padrongianus river, around the ponds of Lido del Sole, le Saline, and further South-East up to Bunthe Beach. However, the species also occurs in the northern part of the Gulf of Olbia, being today confined to small remnant patches from near Via dei Lidi to the area South of Cala Saccaia, while it has disappeared from several other sites where the industrial area of Olbia is in constant expansion, phagocytizing most of the previous coastal wetlands and glasswort garrigues. The occurrence of the species is also recorded at Isola Piana (Farris 2008) in the municipality of Olbia. An herbarium sample was collected by Pignatti (CAG, *sine data*) from Teulada (SU), cited by Bacchetta (2006) but not further confirmed by new findings (Fig. 1).

However, the species is cultivated for ornamental purposes near Alghero, Stintino (SS), Sanluri (VS), San Giovanni di Sinis (Cabras, OR) and Poetto (Cagliari), and sometimes it can occur as a feral plant.

Rarity and threats: The first threat for the species in Sardinia is cementation, with the industrial areas that constantly erode parts of coastal natural environments. Among the other pressures, some of the meta-populations are facing the continuous passage of boats and ferries, which create waves that erode the coast, and combined with sea level rising are drying out tens of plants behind the shores. The expansion of tourist settlements is another issue that involves some meta-populations. Therefore, *in situ* and *ex situ* conservation efforts are needed to address these concerns, together with sensitization of local politicians to the problems concerning biodiversity loss. In 2025, seeds of the species were collected from five different sites to be deposited at the BG-SAR.

Linum tenuifolium L. (*Linaceae*)

Distribution update and clarification

New findings: Laconi (OR) Santa Sofia plateau (39.880507°N, 9.124380°E), grasslands and garrigues, 840 m a.s.l., 01/06/2016, *G. Calvia, A. Tatti, A. Licheri* (Herb. Calvia).

Observations: The species was first recorded by Moris (1837-1859), but Arrigoni (2013) reported it with doubt, affirming it was only cited as a synonym of *L. usitatissimum* subsp. *angustifolium* (Huds.) Thell. However, in the notes at the last volume of his *Flora*, Arrigoni (2015) recorded its presence due to an old finding on the north-western slopes of M. Oseli (Urzulei, OG). Shortly after, Lazzeri & al. (2015) recorded two localities at Funtana Raminosa (Gadoni, NU) and Ortuabis (Meana Sardo, NU). Nonetheless, a few years later, the species was newly excluded from Sardinian flora (Rosati & al. 2020), because the latter authors missed the information above. Later, the species was confirmed again by Lazzeri & al. (2023) and Cuena-Lombraña & al. (2023). The species is present in central-eastern Sardinia, in calcareous substrates of high hills to low mountain sites, particularly in the areas of Supramonte, Ogliastra, Barbagia of Seulo and Sarcidano, where it is scattered in a few sites (Fig. 1).

Rarity and threats: The plant is rare and confined to a restricted area, but it does not seem to suffer any particular threat. Nonetheless, *ex situ* actions such as collection of germplasm should be considered.

Malva stenopetala subsp. ***plazzae*** (Atzei) Iamonico, Bartolucci & Peruzzi (*Malvaceae*)

Distribution update

New findings: Giave (SS) along the road between the SS 131 and the town (40.454288°N, 8.737488°E), slopes exposed North, 500-520 m a.s.l., 15/07/2024, *G. Calvia*.

Observations: This endemic taxon is confined to the north-western side of the island, in the Meilogu sub-region, where it was originally described by Atzei (1995) as *Lavatera plazzae* Atzei, and later proposed at subspecies rank by Iamonico (2014); one year later, Iamonico & al. (2015) transferred the name to the genus *Malva* Tourn. ex L. The taxon is known from a small area of northwestern Sardinia, in a single macro-area and nearly 10 sites, all included in the municipalities of Bonorva, Cossoine, Giave, and Semestene, within the administrative province of Sassari (Iamonico 2014; Santo & al. 2015). Specifically, the species was known from the areas between the train station of Giave and the junction to Bonorva, in the vicinity of the SS 131. Other isolated localities were reported in secondary roads between Bonorva and Cossoine, between Bonorva and Giave, and between Pozzomaggiore and Semestene. In all the stations reported, the plants grew along margins of pastures, in uncultivated areas, scarps, and along roadsides, in the vicinity of the four aforementioned towns (Iamonico 2014). During the last years, we were able to confirm only partly the old records (e.g., in sites near Bonorva reported in websites such as Acta Plantarum www.actaplantarum.org/forum/viewtopic.php?t=135996), and find new stations within the previously circumscribed range (Fig. 1).

Rarity and threats: The taxon is rather rare, with some hundred plants observed in recent years. Moreover, it is currently threatened by works on the SS 131, which have partly devastated its *locus classicus* and neighbouring areas, such as that between the junction to Cossoine and that to Bonorva, where the plants have been extirpated in the last few years from at least two previously known meta-populations. Another issue is represented by wildfires that almost yearly damage several stations. *Ex situ* conservation is ensured at BG-SAR through the preservation of two different seed lots collected in 2006 from Giave, and one accession obtained in 2023 from Semestene.

Monotropa hypopitys L. (*Ericaceae*)

Distribution update

New findings: Nurallao (OR) Funtana is Alinus (39.818144°N, 9.117640°E), riparian woodlands, 570 m a.s.l., 18/05/2003, *G. Bacchetta, C. Dessì*; Domusnovas (SU) Marganai, Sa Mitza ‘e Predi Giuanni Antoniu (39.372974°N, 8.601450°E), holm oak woodlands, 325 m a.s.l., 23/05/2014, *G. Calvia, A. Tatti, G. Paulis*; Laconi (OR) Su Dominariu (39.864717°N, 9.139239°E), holm oak woodlands, 810 m a.s.l., 01/06/2016, *G. Calvia, A. Tatti, A. Licheri*.

Observations: This parasite species is diffused in all Italian regions, although doubtful in Apulia (Bartolucci & al. 2024). In Sardinia, it was first recorded, under the binomial *M. hypophegea* Wallr., by Atzei (1978). Later, Camarda (1984) reported it for Monte Albo (NU). Then, it was recorded in a few phytosociological relevés between Funtana Mela and Bau Onu, in the municipality of Laconi (OR, Bacchetta & al. 2004). Arrigoni (2010) added Monte Irvei (Dorgali, NU) and Genna Selole (Baunei), while Cuena-Lombraña & al. (2023) recorded it on Montarbu di Seui (OG, see: https://www.actaplantarum.org/forum/viewtopic.php?t=38121). During these last decades, the species has been found elsewhere on the island, allowing to clarify its distribution, which is not

only confined to calcareous substrates of Supramontes, Monte Albo, Sarcidano, and Ogliastra but also occurs further South up to holm oak woodlands on Marganai forest (Fig. 2).

Rarity and threats: Although rare, this species does not face any particular threat, being a myco-heterotrophic plant species connected with *Tricholoma* spp. fungi (Leake & al. 2004), which are widespread in *Quercus ilex* L. woodlands.

Romulea revelierei Jord. & Fourr. (*Iridaceae*)

Distribution update

New findings: Tempio Pausania (OT) Mount Limbara, Monte Piciatu (40.837345°N, 9.136339°E), wet meadows, 1007 m a.s.l., 09/05/2021, *G. Calvia, P. Carta, A. Di Giacomo*; Berchidda (OT) wetland along the road from Sas Broccas to Ruosu (40.713222°N, 9.221945°E), 603 m a.s.l., 03/04/2024, *G. Calvia, P. Carta*.

Observations: This taxon is an endemic species that is confirmed to Sardinia and Corsica, while in the Tuscan Archipelago is currently considered extinct (Bartolucci & al. 2024). In Sardinia, the species occurs in several places on the eastern side, from La Maddalena Archipelago (Caprera, La Maddalena, Razzoli and Spargi), Mount Limbara (OT), Buddusò tableau (OT), and Ogliastra (Diana 1991; Cesaraccio & Racheli 1993; Bocchieri 1996; Frignani & Iiriti 2011; Peruzzi & al. 2011; Calvia & Ruggero 2020; Presutti 2022; Cuena-Lombraña & al. 2023). Recently, new stations have been found in other areas of north-eastern Sardinia, such as a plateau included in the public forest Su Filigosu (in the municipality of Oschiri and Berchidda) (Fig. 2).

Rarity and threats: The species is quite rare throughout its distribution range and, given the habitats it occupies, namely wet meadows and Mediterranean temporary ponds, its persistence is threatened by extreme droughts. Moreover, the proliferation of wild boars is increasingly compromising the species habitats, together with the diffusion of invasive plants and the vegetation evolution, as observed in the Limbara area by Calvia & Ruggero (2020).

Silene velutina Pourr. ex Loisel. (*Caryophyllaceae*)

Distribution update

New findings: Palau (OT) Padula Piata, sandy dunes, 3-5 m a.s.l., 12/03/2023, *A. Ruggero, A. Di Giacomo*; La Maddalena (OT) Budelli, Cala di Trana, dunes, 18/09/2025, *A. Ruggero, A. Di Giacomo, M. Ugo*.

Observations: This species is endemic to a restricted portion of North Sardinian and South Corsican coastal areas, included several smaller islets. In Sardinia, it was known for a long time by only findings on La Maddalena Archipelago. The first report was by Mattirolo (1892) from Barrettini Island, based on specimens collected by Moris. Subsequently, the species was not rediscovered at that site. Almost one century later, Cesaraccio & al. (1984) confirmed its presence, identifying several populations located on the islets of Abbatoggia, Stramanari, and Paduleddi. Bocchieri (1992, 1996) additionally recorded another population on La Maddalena Island, “South of Punta Cannone di Ponente.” Shortly after, Sotgiu & al. (1998) documented its occurrence on Caprera Island, near Cala Baccà and on the islet of Punta Baccà. More recently, Pisanu & al. (2014) confirmed all the previously mentioned populations, excepted those from Barrettini and Paduleddi islands, and added two additional localities, Cala del Roto

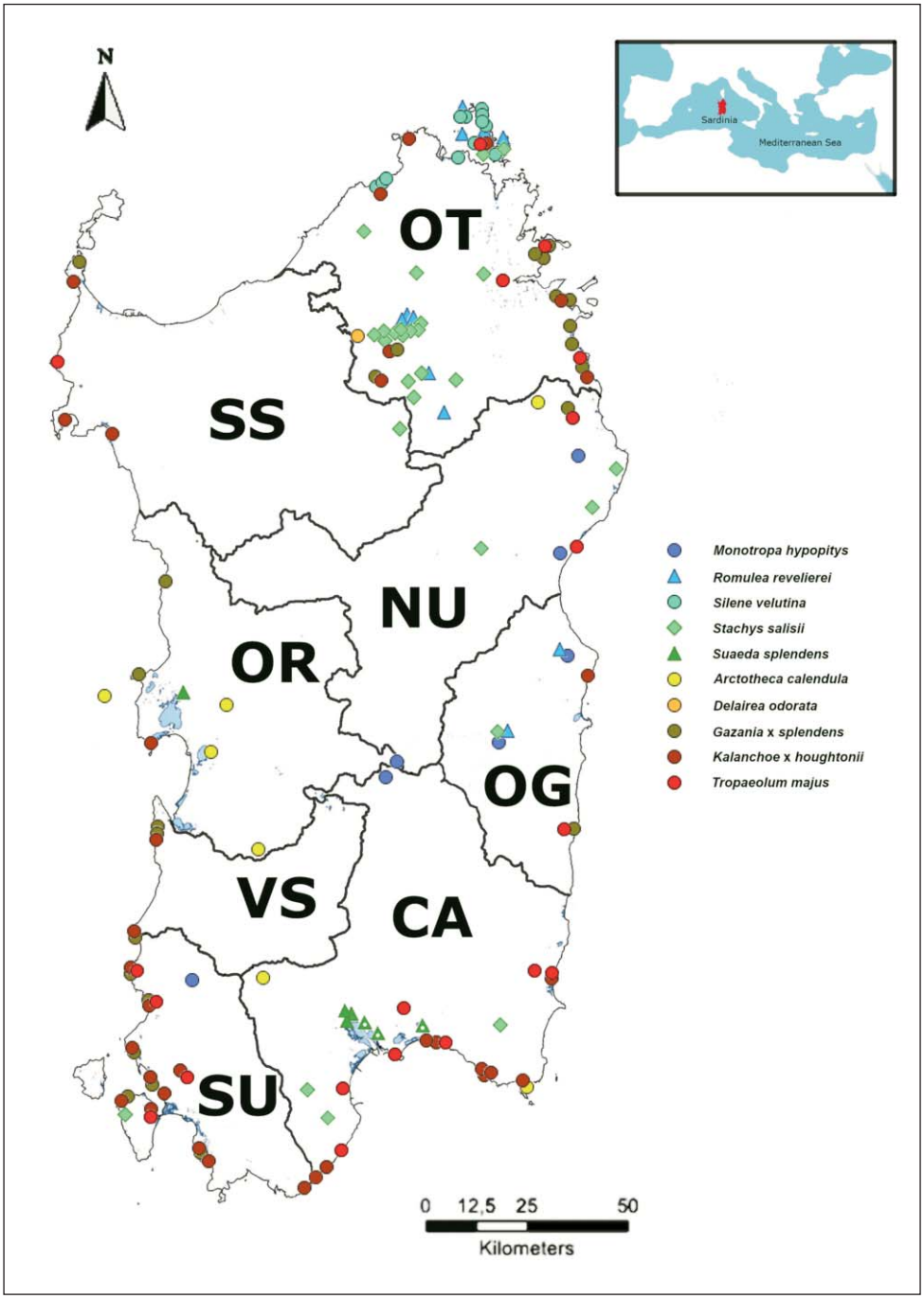

Fig. 2: Distribution map of five native and five alien taxa cited in this article. Pointed symbols refer to not confirmed data.

(Budelli) and Strangolato di Levante. The population from Spiaggia del Morto was also the subject of phytosociological surveys conducted by Biondi & Bagella (2005). Outside the mentioned archipelago, only one place was known in the island of Sardinia, the beach of Lu Riu di Li Saldi (Aglientu, OT), recorded by Ruggero (2000). More recently, after an important damage to this latter population that led it to the brink of extinction, this population is now composed of more than 50 plants, and seems to be in continuous expansion, most probably thanks to an anonymous person that is constantly reinforcing the site with home cultivated specimens of local origin (Ruggero 2022). Moreover, the species has been found elsewhere, in two localities between Lu Chisginagghju Beach and Cala Pischina (Ruggero 2022), where we counted almost 100 plants in 2023. Finally, we identified a small population in the coast of Palau (OT). In 2023 there were nearly 20 plants, four of which flowering, while most of them were young plants. In 2024, their number fell to 13, with three flowering, and in 2025 only seven plants were present, none of them flowering. In the La Maddalena Archipelago, we found the species in another site on the island of Budelli, where a small young population with two plants has been identified in the autumn 2025 (Fig. 2).

Rarity and threats: The species faces several real and immediate threats, particularly affecting the populations of the Maddalena Archipelago and Lu Riu di Li Saldi. These threats are consistent with those commonly observed in coastal dune systems and include the spreading of invasive alien species such as *Carpobrotus* spp., trampling, and the formation of informal paths by hikers, the passage of quads, motocross bikes and off-road cars, and, above all, beachgoers or horseback riding activities. Moreover, wild boars sometimes uproot or completely crush individual plants.

Potential threats also include catastrophic events, such as wildfires, and anthropogenic disturbances, localized or extensive constructions, changes in land use or ownership, and acts of vandalism. These threats have particularly affected the population occurring at Lu Riu di Li Saldi (Ruggero 2022).

Another threat is, locally, the lack of recruitment due to fruit predation by rats. Moreover, in smaller islands and islets, potential threats include events such as sea level rise and storms, especially considering the small surface area of these islets, which makes them highly exposed to these phenomena. Currently, 17 germplasm accessions (ca. 175,000 seeds), collected from different islets of La Maddalena Archipelago, are preserved at the BG-SAR at -25°C. In details, the stored seed lots come from Spiaggia del Morto, beach of Abbatoggia and island of Abbatoggia, Stramanari, Cala Baccà, Lu Chisginagghju Beach, beach of Lu Riu di Li Saldi and islet of Monte Fico.

Stachys salisii Jord. & Fourr. (*Lamiaceae*)

Distribution update

New findings: Aggius (OT) Monti di Mezu (41.004475°N, 9.059550°E), scarps and granitic rocks, 425 m a.s.l., 18/02/2018, *G. Calvia, A. Ruggero, A. Di Giacomo* (Herb. Calvia); Pattada (SS) Mount Lerno (40.591783°N, 9.154145°E), southern slopes not far from the Lake Lerno Dam, 600-650 m a.s.l., 19/05/2019, *G. Calvia*; Nuoro (NU) Monte Ortobene in loc. Nodos de Mamudine, rocky places, 780-800 m a.s.l., 20/05/2020, *M. Cara*; Luras (OT) Padulo Plateau (40.977779°N, 9.134605°E), rocky places facing South near Stazzo Lu Naracone, 450-480 m a.s.l., 17/01/2024, *G. Calvia, F. Mascia*;

Berchidda (OT) rocky places along the road from Sas Broccas to Ruosu (40.713598°N, 9.222802°E), 603 m a.s.l., 03/04/2024, *G. Calvia, P. Carta*; Assemini (CA) Is Fanebas (39.133075°N, 8.871245°E), rocky places near the main pool, 240 m a.s.l., 16/03/2025, *G. Calvia*; Sinnai (CA) Nuraghe Mont'Arbu (39.246901°N, 9.445389°E), rocky places, 790-796 m a.s.l., 21/04/2025, *G. Bacchetta*.

Observations: This taxon is endemic to Sardinia, Corsica, and Tuscan Archipelago and its nomenclatural and distributional vicissitudes were well explained by Borzatti de Loewenstern & Mannocci (2008). However, in that and other works, the species distribution in Sardinia was quite restricted, with certain localities reported from only La Maddalena Archipelago and Sant'Antioco Island (Boi & al. 2013). Actually, the species is more diffused, and found in several places also inland, up to 1000 m a.s.l. on Mount Limbara (Calvia & Ruggero 2020, 2023). In recent years, we found it in inner Gallura (province OT), along the valley of Rio Vignola (Aggius, OT), near Monte Pino and Monti Santu (Sant'Antonio di Gallura/Olbia/Telti), in the Padulo Plateau (Tempio Pausania), in the hills and low mountain areas between Alà dei Sardi, Berchidda, Buddusò, Monti, Oschiri, and Pattada (SS), in Baronie subregion it is known from Siniscola and Orosei. Then it occurs on Mount Ortobene (Nuoro, Brotzu & al. 2021), on the northern slopes of Montarbu of Seui (Cuena-Lombraña & al. 2023), and in the Sulcis mountains (Assemini, Sarroch, CA), where it was also recorded as *S. corsica* var. *micrantha* Bertol. by Bacchetta (2006) (Fig. 2).

Rarity and threats: The species is more diffuse than once thought, and grows in places often hardly accessible, where the only disturbance can be represented by grazing animals. A potential threat could be related to extreme droughts that can inhibit flowering in certain conditions. *Ex situ* actions were carried out through the collection in 2025 of one seed lot from Caprera and one from Santo Stefano Island (La Maddalena), ensuring their conservation at BG-SAR.

Suaeda splendens (Pourr.) Gren. & Godr. (*Amaranthaceae*)

Distribution update and confirmation

New findings: Assemini (CA), mouth of Riu Mannu and Riu Sa Nuxedda (39.266510°N, 9.007323°E), halo-nitrophilous therophytic communities with late-summer phenology, 0 m a.s.l., 08/09/2021, *F. Mascia*; Assemini (CA) loc. Ischiois (39.261577°N, 8.997863°E), halo-nitrophilous communities, 0 m a.s.l., 17/09/2024, *F. Mascia*; Assemini (CA) loc. Piscina Sa Comunidadi near the crossroads to Assemini-Macchiareddu (39.271491°N, 8.990653°E), halo-nitrophilous communities, 0 m a.s.l. 28/05/2009, *F. Mascia*; Riola Sardo (OR), Mare Foghe (39.997651°N, 8.532863°E), halo-nitrophilous therophytic communities with late-summer phenology, 1 m a.s.l., 20/09/2025*, A. Cuena-Lombraña, M. Fois* (CAG).

Observations: Therophyte with a Mediterranean distribution (Albania, Baleares, Egypt, France, Greece, Italy, Morocco, Palestine, Portugal, Sardinia, Sinai, Spain, Turkey; POWO 2026). In Italy is very rare (Pignatti & al. 2017-2019) and known from Apulia, Calabria, and Sardinia, while from Campania only based on historical records (Bartolucci & al. 2024). In Sardinia, the species has been reported from few localities in the metropolitan city of Cagliari, namely Cagliari (*Circa stagnum S. Gilla, inter Ecclesiam S. Petri, et rivum Fangario*, Gennari, 1880, CAG), Santa Gilla (Casu 1911;

Selis, CAG), Simbirizzi endorheic pond, Quartu Sant'Elena (Onnis 1964), and the pond of Maracalagonis (Leg.: L.A. Perra, Det.: B. De Martis 1984, CAG). The more recent mentions of the taxon in Sardinia (Pignatti 1982; Arrigoni 2006; Pignatti & al. 2017-2019; Bartolucci & al. 2024) refer solely to the reiteration of these historical records. Here we confirm its presence within the hinterland of Cagliari, after more than 40 years, and expand its distribution to the Oristano province (Fig. 2).

Rarity and threats: The recent findings provide important confirmation of its presence on the island. The populations observed and monitored in the wider Santa Gilla lagoon area are small and consist of a fluctuating number of individuals. In Riola Sardo, the known population is restricted to an area of approximately five hectares, which has recently undergone environmental changes due to land reclamation and mowing for fodder production. The historical reports cannot be confirmed since the endorheic pond of Simbirizzi is currently a freshwater artificial lake, the area near Fangario has been phagocytized by the city of Cagliari, and the shores of Santa Gilla lagoon have been often modified by human activities.

Alien taxa

Ageratum conyzoides L. (*Asteraceae*)

New casual alien for the flora of Sardinia

Findings: Olbia (OT) SP 73 near the crossroads to Porto Rotondo (40.98716°N, 9.50020°E), roadside, 18 m a.s.l., 07/10/2023, *G. Bertotto* (Herb. Bertotto).

Observations: The species is native to central America but has been used as an ornamental plant in many other countries worldwide (POWO 2026). In Italy, it is considered a casual alien only in Lombardy (Galasso & al. 2024). The finding in Sardinia refers to a few plants, clearly grown by seed reproduction, found along a road, not far from a plant nursery, from where several other taxa have been escaped nearby (Fig. 3).

Arctotheca calendula (L.) Levyns (*Asteraceae*)

Status change from naturalized to invasive

New findings: Santa Giusta (OR) near Parco dello stagno (39.874512°N, 8.609873°E), grasslands, 1 m a.s.l., 02/05/2015, *G. Calvia* (Herb. Calvia); Vallermosa (CA) (39.364983°N, 8.766708°E), invasive in pastures, 230 m a.s.l., 22/04/2022, *F. Mascia*; Villasimius (CA) Timiama (39.119160°N, 9.520243°E), some individuals near the beach, 3 m a.s.l., 24/04/2018, *L. Podda*; Lodè (NU) on the banks of Rio Posada (40.627576°N, 9.559158°E), therophytic meadows, 07/05/2023, *M. Manca*; Tramatza (OR) ovine farm (39.978044°N, 8.634138°E), pastures, 25 m a.s.l., 04/05/2020, *G. Rivieccio, S. Bagella*; Mogoro (OR) organic ovine farm (39.654495°N, 8.774432°E), pastures, 127 m a.s.l., 07/05/2020, *G. Rivieccio, S. Bagella*; Mal di Ventre Island (OR) (39.988717°N, 8.307470°E), grasslands, 5 m a.s.l., 20/03/2024, *G. Rivieccio, S. Bagella*.

Observations: A species native to South Africa, it has been introduced in several other countries worldwide, locally becoming naturalized or invasive (Brundu & al. 2015; Tirgan & al. 2022; Sakhraoui & al. 2024). Its occurrence in Italy is limited to a few regions, where it has been reported as casual in Trentino-Alto Adige, as naturalized in Sardinia and as invasive in Calabria (Galasso & al. 2024). Importantly, the species was

already reported as invasive in Sardinia by Brundu & al. (2015). Later, this data was not perceived by Galasso & al. (2018, 2024).

In Sardinia, it has been recently observed as invasive in fields and abandoned pastures of Campidano, where it occupied extensive areas in the countryside of Vallermosa (CA), and is spreading with alarming speed. Other extensive populations were found in various parts of the Oristano province, while in the East coast, it infests garrigues near the SAC ITB020012 Berchida-Bidderosa (Orosei), and in southeastern Sardinia is currently found with small groups in fallow land and along roadsides near Villasimius (CA, Fig. 2).

Invasiveness: This species has showed a capacity of rapid spread, also resisting herbicide treatments such as glyphosate (Powles & al. 1989; Khalil & al. 2021). In some of the observed sites, such as near Vallermosa and in the province of Oristano, the species is currently expanding on pastures colonizing areas of several hundreds of squared metres, where it is gradually replacing native therophytes.

Bulbine frutescens (L.) Willd. (*Asphodelaceae*)

New casual alien for the flora of Italy (Sardinia)

Findings: Dorgali (NU) loc. Iscopidana (40.274419°N, 9.559929°E), both cultivated and subspontaneous, 26/08/2025, *M. Manca, S. Cupedda* (Herb. Manca); Oschiri (OT) near the communal pinewood (40.723747°N, 9.104505°E) in a fallow land mixed with other escaped plants, 210 m a.s.l., 16/12/2025, *G. Calvia*.

Observations: The species is native to several South African provinces and neighbouring countries, including Cape Provinces, Eswatini, Free State, KwaZulu-Natal, Lesotho, Namibia, the Northern Provinces and others dry areas (POWO 2026). In its native range, it has been traditionally used as medicinal plant for treating wounds, burns, rashes, itches, cracked lips, and similar conditions (Viljoen & al. 2022). The species has been introduced in several countries worldwide, mainly for ornamental purposes. According to the GBIF occurrence map, *B. frutescens* is present in the United States, Brazil, Argentina, New Zeeland, Portugal, Spain, France, and Greece, where it has locally become naturalized or invasive. However, to date, only the congeneric *B. asphodeloides* (L.) Spreng. has been reported in Italy as casual (Galasso & al. 2024), although some "grey literature" sources, together with the confirmed widespread availability of specimens and seeds sold online by Italian nurseries, suggest a much broader presence in the peninsula, at least as a cultivated species.

The species has been introduced into Italy several times also for its medicinal properties, as documented by its inclusion in the botanical iconography collection of Abbot Franciosi (Franciosi, 1805-1822), who listed it as *Anthericum frutescens* L. and illustrated it.

In Sardinia, it occurs casually only near Dorgali and Oschiri (Fig. 3), while it is found cultivated elsewhere in northern and central sites (Budoni, OT; Cala Liberotto, Orosei, NU; Calangianus, OT; Nughedu Santa Vittoria, OR; Nuoro). It is interesting to note that the medicinal properties of the species are also recognized in the area where it was found in Sardinia. A landowner reported having voluntarily introduced *Bulbine* many years ago, using individuals obtained in the village of Dorgali from an unspecified locality. This introduction was motivated specifically by its healing properties, reputed

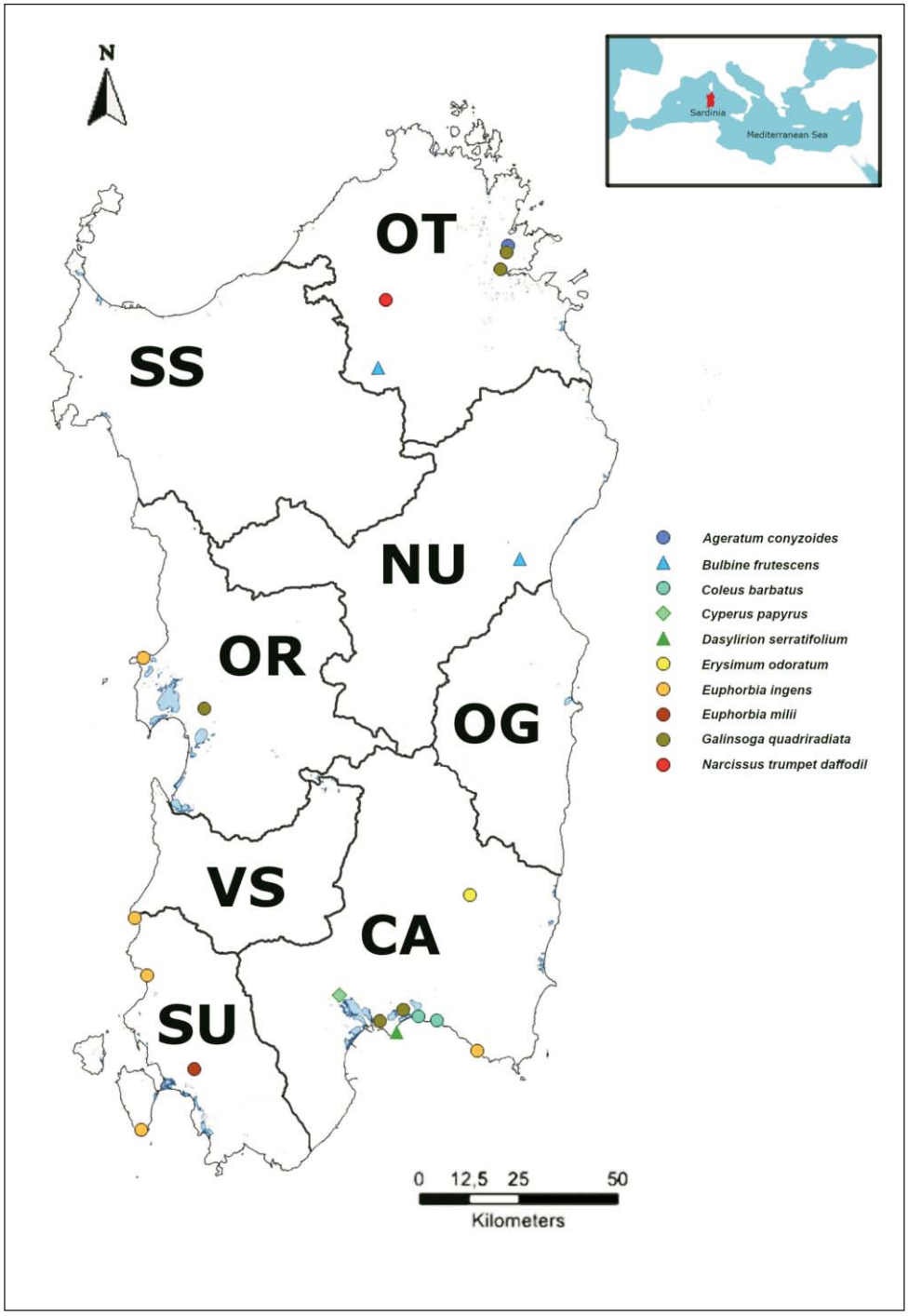

Fig. 3: Distribution map of ten alien taxa cited in this article.

to be similar to those of *Aloe vera* (L.) Burm f., particularly with regard to relieving mosquito bite itching and healing wounds and burns.

Invasiveness: *Bulbine frutescens* is a fast-growing species, very resistant to arid conditions and high temperatures, and it also propagates easily by vegetative means, representing a potential threat to coastal or, more generally, dry habitats. Currently, the presence of the species is limited to a few tufts covering 2-3 m^2 each.

Coleus barbatus (Andrews) Benth. ex G.Don (*Lamiaceae*)

New casual alien for the flora of Italy (Sardinia)

New finding: Quartu Sant'Elena (CA) Flumini (39.214088°N, 9.286097°E), some individuals among the psammophilous communities, 1 m a.s.l., 04/02/2025, *L. Podda, M. Porceddu, L. Dessì* (CAG); Quartu Sant'Elena (CA) Margine Rosso (39.228266°N, 9.228232°E), in the sands in front of the private gardens, 0 m a.s.l., 26/04/2025, *L. Podda*.

Observations: *Coleus barbatus* is a crassulent shrub or subshrub native to Eritrea, Tanzania, the Arabian Peninsula, the Indian subcontinent and south-central China (POWO 2026). Overall, it is widely cultivated, especially for ornamental and medicinal purposes (Alasbahi & Melzig 2010; Reddymalla & al. 2021). The few individuals recorded as casual at the reported sites are most likely the result of escape from nearby gardens where the species has been cultivated for ornamental use (Fig. 3).

Cyperus papyrus L. (*Cyperaceae*)

New casual alien for the flora of Sardinia

Finding: Assemini (CA) via Bacaredda (39.280074°N, 8.996938°E), in a canal near its flow to the Santa Gilla Lagoon, 01/06/2025, 1 m a.s.l., *M. Fois, R. Bolpagni*.

Observations: *Cyperus papyrus* is distributed in tropical central Africa at the upper parts of the White Nile, from where it penetrates westward into Lake Tchad and the Niger region. In the Mediterranean, it is considered native to Egypt and along the Hasbane River watershed and assessed as Vulnerable (VU; Daoud-Bouattour & al. 2010). In Italy, it was reported to date only in Sicily (as naturalized) and Calabria (as casual; Galasso & al. 2024). Here we report for the first time its casual presence in Sardinia, where it colonized a few square metres of a drainage channel from unknown origins but presumably by vegetative propagation (Fig. 3). The small population survived after a fire that occurred in summer 2025.

Dasylirion serratifolium (Karw. ex Schult. & Schult.f.) Zucc. (*Asparagaceae*)

New casual alien for the flora of Italy (Sardinia)

Finding: Cagliari (CA) Punta del Falco (39.188759°N, 9.166601°E), scrublands, 89 m a.s.l., 04/10/2023, *G. Bacchetta* / 04/01/2025, *G. Calvia, S. Macis*.

Observations: This species is native to Mexico (Espejo Serena & López-Ferrari 1996), and is cultivated for ornamental purposes in other continents, sometimes becoming naturalized, as in Spain (Gómez-Bellver & al. 2019). In Sardinia, we found a single adult plant growing in the middle of a calcareous scrubland in the Sella del Diavolo promontory (Fig. 3), an area already affected by the presence of several other alien species, in particular *Agave fourcroydes* Lem. and *Opuntia ficus-indica* (L.) Mill. In the town of

Cagliari, we also found some saplings growing as epiphytes on tree trunks of some palms in the Botanical Garden, meaning that dispersal of its seeds is operated by birds and these could be potentially propagated in other parts of the territory.

Delairea odorata Lem. (*Asteraceae*)

Status change from naturalized to invasive

New finding: Oschiri (OT) Coghinas Dam (40.791729°N, 9.027329°E), invasive on scrublands, open woodlands and rocky places along a road, 200-230 m a.s.l., 05/01/2025, *G. Calvia* (Herb. Calvia).

Observations: This species is native to South Africa and has been introduced elsewhere for ornamental purposes, often becoming naturalized or invasive in the other continents (Robison & al. 2011; POWO 2026). In Sardinia, it was first reported by Pignatti (1982) for Cagliari (not confirmed). Subsequently, it was cited by Viegi (1993), and by Camarda (1998), who reported it as rarely introduced in coastal areas. Later, the species was considered invasive by Brundu & al. (2003), then Pontecorvo (2007) recorded it as cultivated and subspontaneous near Arbus (VS, herbarium specimen preserved in CAG actually belonging to *S. angulatus* L. f.), and so did Bacchetta & al. (2009). Soon after, Celesti-Grapow & al. (2010) recorded it as casual. However, Arrigoni (2015) excluded the species presence since he stated that the previous records were to be referred to *S. angulatus*. The species was then reported as an invasive by Camarda & al. (2016), while Puddu & al. (2016) considered it a casual alien. Later, also Iamonico (2017) confirmed the invasiveness of the species in Sardinia. Finally, it was recorded as casual by Bartolucci & al. (2018). In all these cases, not a single locality was recorded for this species in Sardinia. Three additional records were retrieved from the online platform GBIF(https://www.gbif.org/occurrence/search?geometry=POLYGON((7.488%2039.902,11.004%2039.902,11.004%2041.308,7.488%2041.308,7.488%2039.902))&occurrence_status=present&taxon_key=3134183): one from La Maddalena Island and two from Palau. In the latter case, the reported coordinates corresponded to a hotel garden. We also surveyed the site on La Maddalena in February 2026, however, the area indicated by the reported coordinates was free of both *Delairea odorata* and *Senecio angulatus*, and no evidence of either species was found in neighbouring sites within a few kilometres around. More recently, it was recorded by Calvia & Ruggero (2020) as casual, due to the observation of plants near the Coghinas Dam (Fig. 2), where it is known at least from 1999. Later, the authors reported its naturalization after finding that it was expanding nearby (Calvia & Ruggero 2023). However, the spread has become more and more evident and in January 2025 we found that the plants were covering hundreds of square metres of vegetation and even rocky places nearby.

Invasiveness: The only place where the species is certainly recorded in Sardinia is heavily subject to a fast expansion over a large area, of more than 500 m^2, showing its potential capacity both as a climber and a creeper (Robison & DiTomaso 2010) that is similar to what observed to the relative species *Senecio angulatus*. Given the limited area of occupation, eradication actions should be taken to contain a possible spread also elsewhere.

Erysimum odoratum Ehrh. (*Brassicaceae*)

New casual alien for the flora of Sardinia

Finding: Villasalto (SU) Su Suergiu (39.496117°N, 9.375971°E), at the edge of the holm oak forest near the entrance to the mine, 385 m a.s.l., 16/04/2025, *C. Piga, G. Bacchetta* (CAG).

Observations: This central-European species is quite rare in Italy, where it is currently considered native only in Friuli Venezia Giulia (Bartolucci & al. 2024). In Sardinia, some spontaneous plants have been observed near Villasalto (CA), where they seem to have escaped cultivation from the nearby garden of the Archaeological-Industrial Museum of Mining Activity "Su Suergiu" (Fig. 3).

Euphorbia ingens E.Mey. ex Boiss. (*Euphorbiaceae*)

New casual alien for the flora of Italy (Sardinia)

Findings: Sant'Antioco (SU) Capo Sperone (38.963366°N, 9.421160°E), on a scrubland within a *Pistacia lentiscus* bush, 15 m a.s.l., 02/09/2025, *G. Calvia*; Fluminimaggiore (SU) Portixeddu (39.442155°N, 8.411730°E), discarded plants growing in a scrubland near a road, 15-20 m a.s.l., 04/10/2025, *G. Calvia, S. Macis*; Iglesias (SU) Nebida (39.318005°N, 8.437277°E), fallow land, scrublands, 250 m a.s.l., 04/10/2025, *G. Calvia, S. Macis*; San Vero Milis (OR) Sa Marigosa (40.039015°N, 8.415181°E) fallow land, mixed with several other aliens, 3 m a.s.l., 29/11/2025, *G. Calvia, S. Macis*; Maracalagonis (CA) Torre delle Stelle (39.153352°N, 9.401687°E) on a small channel border, two huge plants mixed with other aliens (5 m a.s.l.), 14/12/2025), *G. Calvia, S. Macis*; Maracalagonis (CA) Genn'e Mari 2 - Torre delle Stelle (39.146403°N, 9.407543°E) huge sample growing on a scrubland, mixed with other alien taxa, 38 m a.s.l., 24/12/2025, *G. Calvia, S. Macis*.

Observations: This species is native to several sub-Saharan countries (POWO 2026). Given its imposing structure and large branching, it has been introduced for ornamental purposes elsewhere, not showing particular capacity of naturalization, except in rare cases such as the Hawaii (Lau & Frohlich 2012). In Sardinia, we recently found a few specimens growing in semi-natural environments, after more or less ancient discarding that allowed these plants to start a slow colonization. At numerous other places across the island the species is only cultivated, originating giant plants that can partly collapse or lose fragments, which are sometimes illegally abandoned in landfills or along country roads, a regrettable practice that involves tens of alien taxa and originates numerous plant colonization. In particular, the specimen found in the island of Sant'Antioco and those near Torre delle Stelle exceeded four metres in height, emerging from *Pistacia lentiscus* L. and *Olea europaea* L. var. *sylvestris* (Mill.) Lehr shrubs or small trees. In other cases, it grows on compromised habitats, mixed with alien taxa such as *Acacia saligna* (Labill.) H.L.Wendl. However, at Fluminimaggiore (SU) we only found a few rooted fragments growing in a *Pistacia lentiscus* scrubland, close to a landfill of vegetal remnants, while at Nebida (Iglesias, SU) a plant, about 2 m tall, grows on a scarp. At Sa Marigosa (San Vero Milis, OR), a single plant, 2 m tall, grows in a fallow surrounded by numerous plants of *Agave americana* L., *Arundo donax* L., and *Opuntia tuna* (L.) Mill. (Fig. 3).

Euphorbia milii Des Moul. (*Euphorbiaceae*)
New casual alien for the flora of Italy (Sardinia)
Finding: Tratalias (SU), Parco Monte Nigali (39.103303°N, 9.580281°E), in a scrubland margin, mixed with *Opuntia ficus-indica*, 45 m a.s.l., 07/12/2025, *G. Calvia, S. Macis*.
Observations: A species native to Madagascar, it has been introduced for ornamental purposes to numerous countries worldwide and is currently naturalized in Assam, Bangladesh, Bolivia, Cayman Islands, China, Comoros, Cuba, Dominican Republic, Gambia, Hainan, Haiti, India, Leeward Islands, Mexico, Puerto Rico, Taiwan, Trinidad-Tobago (POWO 2026). However, it has not yet been reported from any country in Europe, therefore this is its first record as a casual alien in the European countries. We observed a few small bushes established spontaneously and covering less than 2 m^2, at the margin of a path in a scrubland strongly affected by an invasion of Cactaceae [*Austrocylindropuntia subulata* (Muehlenpf.) Backeb., *Opuntia ficus-indica*, *O. tuna*], where they grow within a large shrub of *Opuntia ficus-indica* (Fig. 3). Elsewhere, the species is widely planted as an ornamental in garden alignments.

Galinsoga quadriradiata Ruiz & Pav. (*Asteraceae*)
New casual alien for the flora of Sardinia
Finding: Olbia (OT) SP 73 near the crossroads to Porto Rotondo (40.98716°N, 9.50020°E), roadside, 18 m a.s.l., 07/10/2023, *G. Bertotto* (Herb. Bertotto); Olbia (OT), urban periphery, Via Pier Luigi Nervi (40.93577°N, 9.49201°E), fallow land, roadside, 7 m a.s.l., 22/12/2024, *G. Bertotto*; Quartu Sant'Elena (CA), via T. Tasso (39.235747°N, 9.178569°E), between the sidewalk and the ditch, 21/05/2025, *G. Campus* (CAG); Cagliari (CA) Orto Botanico, Valle di Palabanda (39.222117°N, 09.111907°E), spontaneous and naturalized on humid soils, 34 m a.s.l., 29/11/2024, *L. Podda, A. Lallai* (CAG); Oristano (OR) loc. Pardu Accas (39.926632°N, 8.601178°E), weed of irrigated open-field and greenhouse crops, 5 m a.s.l., 02/10/2025, *F. Mascia* (Herb. Mascia).
Observations: *Galinsoga quadriradiata* is an annual herbaceous plant native to Central and South America, widespread across various regions of the world (Zhang & al. 2021). The species typically grows in disturbed habitats such as cultivated fields, gardens, wastelands, and along roadsides. Until now, it had been reported in all Italian regions except Sardinia (Galasso & al. 2024). The species is morphologically similar to *G. parviflora* Cav., but can be distinguished by the presence of numerous patent glandular hairs, especially in the upper portion of the stem, bristly leaves, entire receptacle scales, and disk achenes bearing linear-acuminate scales, all diagnostic features confirming its identification. The presence of the species in Sardinia is recorded both in northern, central, and southern sectors, in lowland sites (Fig. 3).
Invasiveness: Currently, all the observed sites are colonized by a limited number of plants, covering small surfaces. Nonetheless, this species should be carefully monitored, as it is considered an invasive and harmful agricultural weed capable of reducing crop yields by up to 50% (Yang & al. 2018).

Gazania ×splendens Hend. & Andr.Hend. (*Asteraceae*)
Status change from naturalized to invasive
New findings: Stintino (SS) La Pelosa (40.96829°N, 8.20661°E), escaped from the pots at

the beach kiosk, 5 m a.s.l., 10/04/2023, *A. Cuena-Lombraña, M. Fois*; Arbus (VS) Torre dei Corsari (39.689152°N, 8.455198°E), escaped from the gardens of "Sabbie d'Oro" and now invading throughout most of the dune, 10-30 m a.s.l., 20/06/2024, *A. Cuena-Lombraña, M. Fois*; Berchidda (OT) Museo del Vino (40.788595°N, 9.170666°E), invading drylands above the structure, 350 m a.s.l., 22/04/2025, *G. Calvia*; Golfo Aranci (OT) Terrata (40.979805°N, 9.578172°E), invasive in grasslands, scarps, roadsides, scrublands, 2-40 m a.s.l., 17/01/2026, *G. Calvia, G. Bertotto*; Golfo Aranci (OT) Nodu Pianu (40.960992°N, 9.588511°E), invasive in grasslands, scarps, roadsides, scrublands, 1-15 m a.s.l., 17/01/2026, *G. Calvia, G. Bertotto*.

Observations: This taxon is an artificial hybrid between different species of the African genus *Gazania* (Sakhraoui & al. 2023), introduced all over the world for the strikingly beauty of its flowers (Shahzad & al. 2025), often becoming invasive (Adnan & al. 2025). In Italy, this taxon is considered casual in Sicily, while it has been recently recorded as naturalized in Sardinia (Musarella & al. 2024). However, further findings from different parts of the island, both coastal and inland, led us to reconsider its status as invasive on the island. If, on the one hand, the situation at Porto San Paolo (OT) and Su Portu 'e Su Trigu (Sant'Anna Arresi, SU) has even worsened, a new invasive station has been found in the countryside of Berchidda, where hundreds of plants have strongly colonized grasslands and garrigues close to the local wine museum. A similar situation has also been observed near Golfo Aranci at different sites, Torpè (NU) in the locality Sos Rios, where it is invasive in roadsides, in Torre dei Corsari (Arbus, VS), and on the beach of La Pelosa (Stintino), causing significant damage to the landscape and ecology. Moreover, other populations were observed from North to South at La Maddalena Island (OT), Oschiri (OT), along SP 82 between Olbia and Golfo Aranci, along SS 125 between Murta Maria (Olbia) and Porto San Paolo, San Teodoro, Stintino, Porto Alabe (Tresnuraghes, OR), Portixeddu (Fluminimaggiore), Buggerru (SU), Nebida, Calasetta (SU), Portoscuso (SU), Foxi Manna (Tertenia, OG), Pistis (Arbus), etc. (Fig. 2).

Invasiveness: Different taxa of the genus *Gazania* occur in Sardinia, as already stated by Celesti-Grapow & al. (2010). Their clear distinction, however, proves really complicated since they often show patterns hardly recognizable as certainly attributable to a species or another. Most probably, almost all these plants are of hybrid origin and, when not clear distinction can be obtained, we prefer to classify them as G. ×*splendens*, following Laguna Lumbreras & Ferrer Gallego (2013), Verloove & al. (2019) and Sakhraoui & al. (2023). This *taxon* is fast spreading thanks to a reproductive capacity that allows it to colonize from prolific seed dispersal (Shahzad & al. 2025). Moreover, they are very drought resistant plants, which are increasingly adapted to sub-arid conditions of many Sardinian environments. For this reason they are becoming more and more common, mostly because of their consistent use in gardening. In several of the cited localities, the populations spread in areas of several hundreds of squared metres, invading different habitats such as sandy dunes, drylands, grasslands, roadsides, garrigues, and scrublands from the sea level to 350 m a.s.l.

Kalanchoe* ×*houghtonii D.B.Ward (*Crassulaceae*)

Status change from naturalized to invasive

New findings: La Maddalena (OT) road from Opera Colmi to the crossroads to Cala

Carlotto (41.228007°N, 9.382185°E), scarps, 14/04/2024, *det. A. Ruggero, leg. A. Di Giacomo*; Maracalagonis (CA) Torre delle Stelle (39.145820°N, 9.398723°E), infesting roadsides, scarps, walls and scrublands along Via Ercole, Via dei Gemelli and Via della Fenice, 70-100 m a.s.l., 14/08/2025, *G. Calvia, A. Lallai, S. Macis*; Fluminimaggiore (SU) Portixeddu (39.442472°N, 8.411428°E), fallow land and scrublands, 10-20 m a.s.l., 10/10/2025, *G. Calvia, S. Macis*; Quartu Sant'Elena (CA) Is Mortorius (39.203643°N, 9.328266°E), scrublands, 38 m a.s.l., 02/10/2025, *G. Calvia, A. Lallai, L. Podda*.

Observations: This taxon is an artificial hybrid between *Kalanchoe daigremontiana* Raym.-Hamet & H. Perrier and *K. tubiflora* (Harv.) Raym.-Hamet. (Herrando-Moraira & al. 2020). The parental species are native to Madagascar (POWO 2026), but this hybrid has been created in California, then abundantly cultivated worldwide and is now diffuse in all continents, becoming invasive in many regions (Herrando-Moraira & al. 2020).

In Italy, the taxon is present in most of peninsular regions, Liguria and islands, being mostly naturalized (Basilicata, Campania, Latium, Molise, Sardinia, Sicily and Tuscany), casual in Apulia, Liguria and Marche, and invasive in Calabria (Galasso & al. 2024). Its occurrence in Sardinia was first recorded by Podda & al. (2012). Subsequently, Lallai & Sarigu (2023) reported its naturalization from Santa Margherita di Pula (CA). However, in these last years, we are finding the plant in many habitats, with a diffusion that is alarmingly fast. While we found it in numerous localities, such as Aglientu, Alghero, Berchidda, Budoni, Buggerru, Cabras, Cagliari, Cala Gonone (Dorgali, NU), Calasetta, Carbonia (SU), Carloforte (SU), Chia (Domus de Maria), Costa Rei and Cristolaxedu Beach (Muravera), La Maddalena, Matzaccara (San Giovanni Suergiu, SU), Nebida, Orosei, Oschiri, Palau, Porto Pino and Su Portu 'e Su Trigu (Sant'Anna Arresi, SU), Porto San Paolo, Portoscuso, Portixeddu (Fluminimaggiore), Porto Alabe (Tresnuraghes), Pula, Quartu Sant'Elena, Sant'Antioco, Santa Maria Navarrese, Santa Teresa Gallura, Torre dei Corsari, Villasimius etc., at some places we observed its invasiveness (in particular at Cagliari, La Maddalena, Porto Alabe, Torre dei Corsari, Torre delle Stelle etc.) (Fig. 2).

Invasiveness: The vegetative reproduction allows this taxon to propagate rapidly thanks to several hundreds of propagules originating from each mature leaf (Smith 2020). For this reason, once established, it is capable of fast spreading and creating thick populations. Its eradication proves to be hard, because of the easy detachment of these seedlings when the plant is moved, which ease the dispersion instead of reducing their presence. At many sites, the taxon forms thick and compact formations, covering from a few squared metres to some hundreds of squared metres, often appearing in numerous places on the same site, mostly in ruderal and thermophilous scrubland environments, but more frequently in arid rocky places, where it locally tends to substitute native *Crassulaceae* by means of its abundant propagules.

***Narcissus* trumpet daffodil** group (*Amaryllidaceae*)

New casual alien for the flora of Sardinia

Findings: Tempio Pausania (OT) Vallicciola (40.850200°N, 9.150185°E), meadows and fallow land, 1050-1055 m a.s.l., 21/03/2025, *G. Calvia* (Herb. Calvia).

Observations: This cultivar is diffused as an ornamental plant and sometimes has become feral or even naturalized, as in Lombardy, while in other regions, namely Apulia, and Emilia Romagna, it is considered a casual alien (Galasso & al. 2024). In Sardinia, more specifically in the area of Mount Limbara, this taxon persists for many years in the locality of Vallicciola (Fig. 3), which is strongly affected by a long history of plant introductions (Calvia & Ruggero 2020). However, only in 2025 we managed to discern this taxon from other daffodils once planted in that area and now spreading nearby in at least three different sites, each of them occupying an area of a few squared metres (Calvia & Ruggero 2023).

Tropaeolum majus L. (*Tropaeolaceae*)

Status change from naturalized to invasive

New findings: Muravera (CA) along the canal flanking Via Sarrabus (39.416868°N, 9.586862°E), scarps, and fallow land nearby, invasive, 4 m a.s.l., 18/05/2025, *S. Macis*; Iglesias (SU) Nebida (39.310423°N, 8.437073°E), on a scarp under the main road before the parking area of "Dal Capitano" restaurant, 220-230 m a.s.l., 10/10/2025, *G. Calvia, S. Macis*; Tertenia (OG) road to Foxi Manna and Sarrala Beach (39.692621°N, 9.648520°E), ground cover along the roadside for several tens of metres, 18/10/2025, *G. Calvia, S. Macis*; Olbia (OT) along Via Raica (40.907300°N, 9.429387°E) roadsides, scarps, 80-90 m a.s.l., 27/10/2025, *G. Calvia, G. Bertotto*; Pula (CA) riverbanks of Rio di Pula (39.015390°N, 9.003353°E), from near the bridge at the entrance of the town to the locality of Bia Monte, uphill, 10-40 m a.s.l., 04/06/2025, *M. Fois, A. Dalla Vecchia, F. Mascia*; Capoterra (CA), loc. Riu Bacalamanza (39.134336°N, 8.994931°E), riparian vegetation, observed since May 2022 and recorded as invasive in 2025, 19 m a.s.l., *F. Mascia*; Settimo San Pietro (CA) Sa Terra de Sa Cresia (39.288168°N, 9.182388°E), riparian vegetation, 56-58 m a.s.l., *G. Bacchetta*; La Maddalena (OT) northern periphery (41.218732°N, 9.405031°E) invasive in an area of at least 700 m^2, covering an entire valley, 25-50 m a.s.l., 23/03/2026, *G. Calvia*.

Observations: This species is native to Peru but given its properties it has been cultivated in Europe since 17th century (Christenhusz 2012), then became an ornamental plant that has currently been introduced in every other continent (POWO 2026). In Italy, this species is present in most of regions, although mostly casual, with the exception of Campania, Liguria, Sardinia and Sicily where it was considered naturalized, and Calabria where it is invasive (Galasso & al. 2024). We found extensive populations in various areas of Sardinia, where it is colonising scarps, fallow land and roadsides. Major invasion evidence was observed near La Maddalena, Muravera, Nebida (where it is ubiquitous), Foxi Manna (Tertenia), Olbia, Pula, and Capoterra. Several other places host naturalized populations, such as near Argentiera (Sassari), Budoni, Buggerru, Cagliari, Carbonia, Castiadas, Dolianova, Domus de Maria, Dorgali (https://www.actaplantarum.org/forum/viewtopic.php?t=128887), Golfo Aranci, Orosei, Quartu Sant'Elena, Sant'Antioco, Torpè (NU) etc. (Fig. 2).

Invasiveness: This species tends to colonize mostly by means of vegetative propagation, often creeping or climbing other surfaces and easily expanding towards vast areas (Vesperinas & al. 2001). For this reason, from the places where it is cultivated or discarded the spread is often rapid and ubiquitous. Together with vegetative, also seed ger-

mination enables the species to colonize new sites, therefore the species should be regarded as a potential threat to natural environments. A few examples were observed at La Maddalena Island, where several invasive populations grow in areas of several hundreds of squared metres, up to more than 700 m^2 of total cover in the most worrying case. Similar situations are found near Capoterra and in the small village of Nebida. In this latter case, the species has spread all around the urban area and most of the surrounding places, heavily colonizing every kind of environment for a total surface estimable in thousands of squared metres.

Addenda to previous contributions (1-60)

Native

Asplenium marinum L. (*Aspleniaceae*)

During the last year, we found the species in other stations on Razzoli Island (La Maddalena). Moreover, we found it on the islands of Caprera and La Maddalena, confirming previous reports by Bocchieri (1996), who only cited "*in verbis*" communication.

Helicodiceros muscivorus (L.f.) Engl. (*Araceae*)

A second growing station has been found in the municipality of Villagrande Strisaili (OG), several kilometres far from that recorded by Scudu (2022).

Jacobaea maritima (L.) Pelser & Meijen subsp. ***maritima*** (*Asteraceae*)

A rich population occurs along the seafront of Alghero, while other two occur in a meadow North of Le Tonnare Beach (Stintino), and on the island of Tavolara (Olbia), just below Punta Cannone (500 m a.s.l.).

Ludwigia palustris (L.) Elliott (*Plantaginaceae*)

We observed its occurrence in the medium trait of Rio Posada, in the municipality of Torpè.

Persicaria decipiens (R. Br.) K. L. Wilson (*Polygonaceae*)

We recently observed the presence of the species along a canal in the municipality of Muravera, in a streamlet near Tortolì (OG), and in a canal near Isuledda beach (San Teodoro).

Piptatherum coerulescens (Desf.) P.Beauv. (*Poaceae*)

During 2025, a new inner population was found in the municipality of Fluminimaggiore.

Alien

Artemisia verlotiorum Lamotte (*Asteraceae*)

Although rich, the previous contribution was far from completely defining the exact distribution of this invasive species in Sardinia. Indeed, during the last year we found new stations in the following municipalities: Aggius, Assemini, Bari Sardo (OG), Bortigiadas (OT), Perfugas (SS), Tortolì, Ussassai (OG).

Asparagus asparagoides (L.) Druce (*Asparagaceae*)

We recently observed its presence around the Dam "Puzzoni", at Villaggio Piras, Cala Chiesa, near Spalmatore Beach, and near Chiesa Trinità, in the island of La Maddalena. Moreover, invasive populations and other scattered groups occur in the outskirts of Cortoghiana (Carbonia), and all around Torre delle Stelle, while a small population occurs along Via Sulcitana at the entrance of Elmas from Assemini. The species has also been recorded at Tuvixeddu (Cagliari) and in other parts of Molentargius Natural Park

(Cagliari), further North than previously known, where its expansion has been observed near the Riu Saliu canal, along the stretch intersecting Via Mercalli and Viale Marconi.

Cenchrus setaceus (Forssk.) Morrone (*Poaceae*)

In 2025 we found several new growing stations, many of them concentrated in the area between San Giovanni Suergiu and Carbonia, where it is locally invasive. We also found plants of this species in the municipality of Golfo Aranci, and in other sites near Olbia, Porto San Paolo, San Teodoro and Budoni in the North, near Foxi Manna (Tertenia) in central East, Nurachi (OR) in central West, at Calasetta and along SS 130 between Siliqua (CA) and Musei (SU) in the South. At Calasetta, starting from an invaded garden, the species has colonized roadsides and fallow land at the western periphery of the town.

Chloris gayana Kunth (*Poaceae*)

A new growing station has been found at Li Cuncheddi, in the countryside of Loiri-Porto San Paolo, and another at Torre dei Corsari.

Commelina erecta L. (*Commelinaceae*)

We recently found a few plants of this species on fallow land in the town of Portoscuso, while in the village of Nebida it occurs along sidewalks and roadsides. Near Barbusi (Carbonia), we found it on a grassland. Some juveniles have been observed in Monserrato (CA) in the streets of the town and at Cagliari in the streets near the Botanical Garden.

Cyperus brevifolioides Thieret & Delahouss. (*Cyperaceae*)

A new growing station occurs in the municipality of Olbia, near Porto Rotondo.

Eclipta prostrata (L.) L. (*Asteraceae*)

In 2025 we recorded for the first time the presence of this species along the shores of Lake Coghinas (Oschiri), on the island of La Maddalena, at Berchida Beach (Siniscola), and near the parking area of Is Solinas Beach (Masainas, SU).

Eragrostis curvula (Schrad.) Nees (*Poaceae*)

New growing stations were found along the SS 729, in the municipalities of Loiri-Porto San Paolo (Enas) and Tula (SS), but also in the municipality of Palau, near Costa Serena Hotel.

Halophila stipulacea (Forssk.) Asch. (*Hydrocharitaceae*)

The species appears largely spread along the eastern coast of the province of Olbia-Tempio. Indeed, it has been furtherly observed in several other parts of the Gulf of Olbia, and northwards it consistently appears from Portisco (Olbia) to Cala di Volpe (Arzachena), further expanding from the previous records from Razza di Juncu Beach shallows. Drifted clones and fragments have also been observed at the Ricciolina Beach in La Maddalena.

Lycium ferocissimum Miers (*Solanaceae*)

This invasive species has been further observed, during 2025, in other places of southern Sardinia such as Torre delle Stelle (Maracalagonis), Poetto Beach (Quartu Sant'Elena), Tuvixeddu (Cagliari), several sites around Sestu (CA), Settimo San Pietro, and other sites in the municipality of Assemini.

Paraserianthes lophantha (Willd.) I.C.Nielsen (*Fabaceae*)

A new growing station is found in the locality Punta Saline (Olbia), while others occur in the municipalities of Alghero and Stintino, at Cagliari, Costa Paradiso (Trinità d'Agultu, OT), Porto Palma (Arbus), near Putzu Idu (San Vero Milis) and in several localities of

Pula and La Maddalena Island.

Sporobolus indicus (L.) R.Br. (*Poaceae*)

During 2025, we found several plants of this species growing on grasslands and along roadsides in the municipality of Perfugas. Moreover, another station was found in the periphery of Palau.

Conclusion

The distribution of 30 taxa growing in Sardinia has been assessed here, with 15 taxa being rare to scattered natives, and 15 taxa being alien. Among them, 10 are of recent introduction and spread and are here recorded as new for the alien flora of Sardinia and appear to be still casual on the island. However, other five taxa are now considered invasive after the record of their fast and uncontrolled spread across vast parts of the island, often in the vicinity of human and tourist settlements.

Our surveys allowed on the one hand to define the distribution of some very rare plant taxa that did not receive confirmation in the last decades, with a further clarification of their distribution, together with that of some other rare to scattered taxa. On the other hand, we could observe how some taxa are suffering the activities promoted by humans on natural and semi-natural environments, leading to a gradual loss of both habitats and local populations. In particular, we recorded local extirpation of plants or entire populations of the following studied native taxa during the last years or decades: *Ceratophyllum submersum* subsp. *submersum*, *Damasonium bourgaei*, *Limoniastrum monopetalum*, *Malva stenopetala* subsp. *plazzae*, *Silene velutina*, *Suaeda splendens*. Most remarkably, we were also able to find some new stations, which should be worthy of protection and conservation strategies.

These new discoveries highlight the importance of intensifying fieldwork (Sakhraoui & al. 2023) to maintain updated and dynamic floristic inventories (Cuena-Lombraña & al. 2023), thereby enabling a more accurate and comprehensive understanding of the regional plant diversity and the ongoing dynamics of alien species spread and invasion.

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Addresses of the authors:
Giacomo Calvia[1, 2] (https://orcid.org/0000-0002-3100-2629), Mauro Fois[2] (https://orcid.org/0000-0002-4178-0790), Francesco Mascia[3] (https://orcid.org/0000-0002-8777-8928), Lina Podda[2] (https://orcid.org/0000-0001-6737-737X), Manuela Manca[4] (https://orcid.org/0000-0003-1135-0535), Giuseppe Bertotto[5], Giuliano Campus[6] (https://orcid.org/0000-0003-4067-9137), Andrea Lallai[7] (https://orcid.org/0000-0003-4810-7096), Alessandro Ruggero[2] (https://orcid.org/0000-0002-2199-1232), Marco Porceddu[2] (https://orcid.org/0000-0002-3180-9000), Giovanni Rivieccio[8] (https://orcid.org/0000-0003-0840-0212), Alba Cuena-Lombraña[2] (https://orcid.org/0000-0003-2750-6274), Simonetta Bagella[8] (https://orcid.org/0000-0002-8519-2675), Emmanuele Farris[8] (https://orcid.org/0000-0002-9843-5998) & Gianluigi Bacchetta[2] (https://orcid.org/0000-0002-1714-3978),
[1]Free University of Bozen-Bolzano, Faculty of Agricultural, Environmental and Food Sciences. Piazza Università, 5 - 39100, Bozen-Bolzano, Italy; Email: giacomo.calvia@gmail.com
[2]Centre for Conservation of Biodiversity (CCB) and Sardinian Germplasm Bank (BG-SAR), Department of Sciences of Life and Environment, University of Cagliari, Viale Sant'Ignazio da Laconi 13, 09123 Cagliari, Italy.

[3]Department of Life Sciences, University of Siena, Via P.A. Mattioli 4, 53100 Siena, Italy.
[4]Via Roma 49, 08100 Nuoro, Italy.
[5]Via Ippolito Nievo 29, 07026 Olbia (SS) Italy.
[6]Via G. Rossini 69, 09045 Quartu Sant'Elena, Italy.
[7]Hortus Botanicus Karalitanus (HBK), University of Cagliari, Viale Sant'Ignazio da Laconi 9–11,09123 Cagliari, Italy.
[8]Department of Chemical, Physical, Mathematical and Natural Sciences, University of Sassari, Via Piandanna 4, Sassari 07100, Italy.