

Chromosome numbers for the Italian flora: 3

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Abstract

In this contribution new chromosome data obtained from material collected in Italy are presented. It includes four chromosome counts for the following genera: *Bellevalia* (Asparagaceae), *Genista* (Fabaceae), *Linaria* (Plantaginaceae), and *Teucrium* (Lamiaceae).

Keywords

Cytogeography, cytotaxonomy, karyotype

How to contribute

Texts concerning new chromosome data should be submitted electronically to Lorenzo Peruzzi (lorenzo.peruzzi@unipi.it), including indications of voucher specimens and methods used.

Chromosome counts

Bellevalia webbiana Parl. (Asparagaceae)

Chromosome number. $2n = 16$ (Fig. 1)

Voucher specimen. ITALY. Emilia-Romagna. Località Pergola, nei terreni dell'azienda agricola Lombardi (Faenza, Ravenna); margine di bosco mesofilo nei pressi di un oliveto, 144 m, 31 March 2016, F. Roma-Marzio, G. Astuti (PI).

Method. Squash preparations were made on root tips obtained from cultivated bulbs. Root tips were pre-treated with 0.4% colchicine for 3 hours and then fixed in Carnoy fixative solution for 1 hour. After hydrolysis in 1N HCl at 60° C, the tips were stained in leuco-basic fuchsin. For karyotype reconstruction, four metapahasic plates were measured the KaryoType software (Altinordu et al. 2016), which was also used to match homologous chromosomes among plates and to build a mean haploid idiogram. Karyotype asymmetry was evaluated according to the parameters suggested by Peruzzi and Eroğlu (2013).

Observations. *Bellevalia webbiana* is a species endemic to a pre-Apennine belt between the administrative regions of Tuscany and Emilia-Romagna, where it occurs in the hills around Florence and Faenza, respectively (Gestri et al. 2010). This species is known to be tetraploid, possibly arisen from allopolyploidy (Borzatti von Loewenstein et al. 2013). However, chromosome counts were available for Tuscan populations only (Chiarugi 1949, Capineri et al. 1979, Maggini 1972) and no data for populations occurring in Romagna were reported so far. Hence, our count is the first for *B. webbiana* in this region and confirms the tetraploid asset of the species. The reconstructed karyotype (Fig. 1) and, consequently, the asymmetry indices, i.e., $CV_{CL} = 29.72$ and $M_{CA} = 31.08$, are also fully congruent with those available in the literature for Tuscan accessions (Chiarugi 1949, Maggini 1972, Borzatti von Loewenstein et al. 2013).

G. Astuti, M. Ruffini Castiglione

Genista tenorei G.Don (Fabaceae)

Chromosome number. $2n = 96$ (Fig. 2)

Voucher specimen. ITALY. Basilicata. Pollino Massif, Piano di Ruggio, 1 August 2016, L. Bernardo, L. Peruzzi (seeds collected in the field only; a specimen from the same locality, collected on 13 June 2013 by L. Bernardo, D. Gargano, is conserved in CLU n. 23782).

Method. Squash preparations were made on root tips obtained from germinating seeds. Root tips were pre-treated with 0.4% colchicine for 3 hours and then fixed in Carnoy fixative solution for 1 hour. After hydrolysis in 1N HCl at 60° C, the tips were stained in leuco-basic fuchsin.



Figure 1. *Bellevalia webbiana* Parl., $2n = 16$. Metaphasic plate and haploid idiogram. Scale bar: 10 μm .

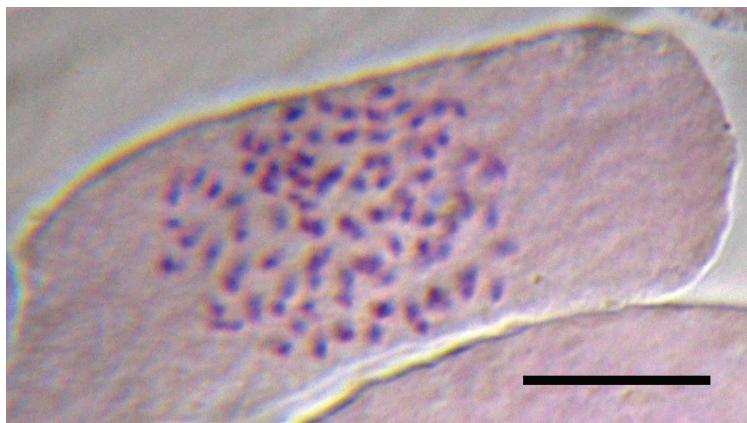


Figure 2. *Genista tenorei* G.Don, $2n = 96$. Scale bar: 10 μm .

Observations. *Genista tenorei* is endemic to Italy, limited to the Pollino Massif and belonging to the complex of *G. tinctoria* L. *Genista tenorei* is morphologically very similar to the SE European *G. depressa* M.Bieb. (Bernardo and Peruzzi 2016). This is

the first chromosome count for this species. Instead, for *G. depressa* a single $2n = 48$ count is available (Papanicolau 1984). Accordingly, our count seems to support the hypothesis of *G. tenorei* as a distinct species with respect to *G. depressa*. While $2n = 48$ is reported for several Italian localities of the related *G. tinctoria*, reports with $2n = 96$ chromosomes have also been published for this species from NW Italy (Forissier 1973, Cusma Velari et al. 2006) and Turkey (Esra et al. 2009).

F. Roma-Marzio, L. Bernardo, L. Peruzzi

Linaria purpurea (L.) Mill. (Plantaginaceae)

Chromosome number. $2n = 12$ (Fig. 3)

Voucher specimen. **ITALY. Tuscany.** Monte Calvi, (Livorno), near Villa Lanzi, 250–300 m, 22 May 2016, *D. Fontana* (seeds collected in the field only; a specimen from the same area, collected on 5 June 2010 by *L. Peruzzi, G. Gestri, B. Pierini, V. Lazzzeri*, is conserved in PI).

Method. Squash preparations were made on root tips obtained from germinating seeds. Root tips were pre-treated with 0.4% colchicine for 3 hours and then fixed in Carnoy fixative solution for 1 hour. After hydrolysis in 1N HCl at 60° C, the tips were stained in leuco-basic fuchsin.

Observations. *Linaria purpurea* is an endemic Italian species ranging from Emilia-Romagna to Calabria and Sicily (Peruzzi et al. 2014). Our chromosome count is the first from Tuscany and is in accord with all the previous counts derived from populations occurring in Sicily, Calabria and Umbria (Bedini et al. 2010 onwards).

A. Carta, M. D'Antraccoli, F. Roma-Marzio

Teucrium flavum L. subsp. *flavum* (Lamiaceae)

Chromosome number. $2n = 32$ (Fig. 4)

Voucher specimen. **ITALY. Toscana.** Calignaia (Livorno), nella macchia, 57 m, 29 June 2016, *F. Roma-Marzio* (PI, Herb. Roma-Marzio).

Method. Squash preparations were made on root tips obtained from germinating seeds. Root tips were pre-treated with 0.4% colchicine for 3 hours and then fixed in Carnoy fixative solution for 1 hour. After hydrolysis in 1N HCl at 60° C, the tips were stained in leuco-basic fuchsin.

Observations. *Teucrium flavum* is an evergreen woody shrub whose range extends over the entire Mediterranean Basin, from the eastern coasts of Spain to Turkey (Lakušić et al. 2006). *Teucrium flavum* belongs to *T. sect. Chamaedrys* (Mill.) Schreb., including four subspecific taxa (Euro+Med 2006 onwards). The species within that section show



Figure 3. *Linaria purpurea* (L.) Mill., $2n = 12$. Scale bar: 10 μm .

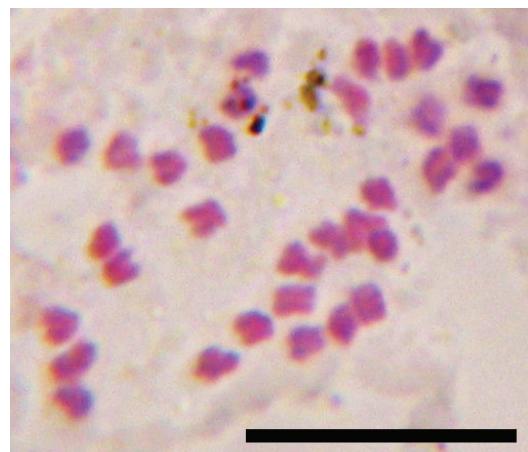


Figure 4. *Teucrium flavum* L. subsp. *flavum*, $2n = 32$. Scale bar: 10 μm .

different chromosome numbers, ranging from $2n = 28$ to $2n = 96$ (Özcan et al. 2015). However, all the previous counts for *T. flavum* report $2n = 32$ (Rice et al. 2014, Özcan et al. 2015). In Italy, only two counts are currently known, from populations occurring in Sicily and Latium (Bedini et al. 2010 onwards). Our count is the first for Tuscany and confirms the only known chromosome number reported for the species.

F. Roma-Marzio

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Personal private herbaria: a valuable but neglected source of floristic data. The case of Italian collections today

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Abstract

Today private collections still represent an important source of information as is evident from the available literature, where, in many cases, private collections are mentioned both in floristic and taxonomic/systematic researches. We present a summary of the main information about private herbaria in Italy, whose collections are currently increasing. Based on our survey, we retrieved information on 34 personal herbaria where 156,361 specimens are preserved at present. Piedmont and Tuscany resulted the two Italian regions with the highest number of collections, whereas for 9 regions we obtained no answer. The most represented families resulted Asteraceae and Poaceae, whereas the most represented genera resulted *Carex*, *Trifolium*, and *Hieracium*. Taken all together, these collections rank 16th among the 68 institutional public herbaria officially recognised in Italy.

Keywords

Herbarium specimens, Italian botanist, plant collection, floristic data

Introduction

Private herbarium collections have represented the starting point for the establishment of many of the still-extant natural history museums around the world. In the 17th and 18th centuries, the fashion for collecting plants resulted in the amassing of large private collections, which later became the basis of institutional collections (Stearn 1971). Thus, the Oxford University herbarium (OXF, acronyms follow Thiers 2016)

was largely formed from the private herbaria of Jacob Bobart the Younger (1641–1719), William Sherard (1658–1728), Henry Barron Fielding (1805–1851) and George Claridge Druce (1850–1932) (Clokie 1964, Stearn 1971). The Natural History Museum of London (BM) owes its foundation to the tireless activity of Sir Hans Sloane (1660–1753) and Sir Joseph Banks (1743–1820), whose houses quickly became too full to accommodate their collections (Beer 1953, Stearn 1971). Likewise, the herbarium of the Royal Botanic Gardens, Kew (K) started to develop from the private herbaria of Sir William Jackson Hooker (1785–1865), George Bentham (1800–1884), and William Arnold Bromfield (1801–1851) (Stearn 1971). In Italy, there are 68 institutional public herbaria (Taffetani 2012), many of them hosting significant collections donated by private collectors. These collections represent an important part of preserved plant specimens. The herbarium of the University of Florence (FI), currently preserving more than five million samples, hosts the private collection of its founder, Filippo Parlatore (1816–1877), composed by about 300,000 specimens (Cuccini 2009), as well as other private collections. Among these, one of the most important is the herbarium of Philip Barker Webb (1793–1854) (FI-W), counting about 250,000 specimens, and purchased in the 1855, by the then curator Filippo Parlatore (Moggi 1993, Nepi 2009). The herbarium of the University of Pisa (PI) hosts nine main private collections, donated to or purchased by the university and detached from the general collection (Amadei et al. 2007, 2012). Among these collections, noteworthy are the herbarium of Pietro Pellegrini (1867–1957), composed by 22,000 specimens, mainly from the Apuan Alps (Garbari and Del Carratore 1993); the herbarium of Teodoro Caruel (1830–1898), counting about 14,500 samples representing a valuable document related to his “*Prodromo della Flora Toscana*” (Caruel 1860); and the herbarium of Michele Guadagno (1878–1930) with gatherings mainly from southern Italy.

Private collections are preserved also in other Italian public institutions like civic museums or schools. To name but a few examples, the herbarium of Giovanni Montini (1802–1854) is preserved in the Civic Museum of Bassano del Grappa (Lasen and Busnardo 1993); the herbarium of Pietro Zangheri (1889–1983) is currently preserved in a specific section of the Civic Museum of Natural History of Verona (VER) (Viciani 2011); and the three herbaria of Erminio Ferrarini (1919–2002), overall composed by 8655 samples, are now preserved in the high school “Guglielmo Marconi” of Carrara (Tuscany), the natural history museum of the Lunigiana (Aulla, Tuscany) and in FI (Maccioni et al. 2008).

Today, private collections still represent an important source of information. This is evident from the available literature where, in many cases, private collections are mentioned both in floristic (e.g. Bartolucci and Peruzzi 2007, Anzalone et al. 2010, Selvi 2010, Peruzzi et al. 2011, 2016, Roma-Marzio et al. 2016, Ardenghi and Polani 2016) and taxonomic / systematic researches (e.g. Brilli-Cattarini and Gubellini 1986, Iamonico 2015, Peccenini and Polatschek 2016).

In this paper, we make a first attempt to summarize the main information about private herbaria currently preserved in Italy.

Material and methods

We defined as private herbarium a collection of dried vascular plants, continuously increased with new gatherings, and independently managed by a private collector, without support from any public or private research institution. We excluded the institutional herbaria listed in the *Index Herbariorum* (Thiers 2016), and all the herbaria maintained in the public bodies such as educational institutions, regional and national parks, libraries and public archives.

In order to obtain data from Italian private collections of plants, we prepared an on-line questionnaire based on a Google module. The questionnaire included 17 questions (15 with a free-text answer and 2 with a multiple-choice answer), focused on the herbarium name, its owner, the starting date of collection and the number and the main geographic origin of specimens, the address where the herbarium is preserved, the kind of management (including pest control), and other questions about the dissemination of data in the past, and the availability of the owner to share the data (Table 1).

In order to disseminate our initiative we used the mailing list of the working group for floristics, systematics and evolution of the Italian Botanical Society (*Gruppo per la Floristica, Sistemática ed Evoluzione*). In addition we used the most common social networks (e.g. Facebook) and the Acta Plantarum forum (<http://www.actaplantarum.org/>), an Italian website focused on national floristic information; in some cases we also sent e-mail messages to personal addresses.

Results

Based on our survey, we checked 34 personal herbaria, where 156,361 specimens are currently preserved. A list of personal herbaria, and relative informations, can be freely accessed at <https://goo.gl/eJA0Ga>. This online checklist will be continuously updated in case that other collectors will send us information about their collections.

The richest herbarium, with 20,000 estimated samples, resulted the *Herbarium Antonietti* (Piedmont) followed by *Herbarium Soldano* (Piedmont, 18,100 samples) and *Herbarium Branchetti* (Emilia-Romagna, 13,000 samples). On the other hand, the herbarium with the lower number of samples resulted the *Herbarium Caetani* with 38 specimens (Table 2). The oldest herbarium is the *Herb. Hözl Norbert* started in 1960 and preserved in Andriano (Bolzano), followed by the *Erbario Soldano* started in 1973, whereas the most recent are *Erbario Pascale* and *Herbarium Caetani* started in 2014.

Concerning the geographic location of the herbaria (Figure 1), Piedmont and Tuscany resulted the two Italian regions with the highest number (8 herbaria each), whereas we obtained no answer from nine regions (Veneto, Friuli Venezia Giulia, Marche, Umbria, Lazio, Abruzzo, Molise, Puglia, and Basilicata). Concerning the regions where most of the specimens were collected, these correspond to the regions where each herbarium is preserved.

Table I. Questions proposed in the online survey.

Question	Type of answer
Name of the herbarium	free
Owner and email	free
City where the herbarium is preserved	free
Number of preserved samples (add * for estimated number)	free
Are the specimens organized in a database? In case of positive answer, what kind of database?	free
Are you willing to share your data in a free and online database?	yes/no
Are photo/scan of the specimens available?	yes/no
Starting date of the collection	free
Number of taxa (add * for estimated number)	free
Most represented family (and %)	free
Most represented genus (and %)	free
Main country where the samples were collected (and %)	free
Main Italian region where the samples were collected (and%)	free
Type of organization of the collection (e.g. alphabetical order of genera)	free
Has the herbarium some pests? How it is serious?	free
Are the samples subjected to a pest control? What kind?	free
Was the herbarium mentioned in some scientific publications? Could you cite some?	free

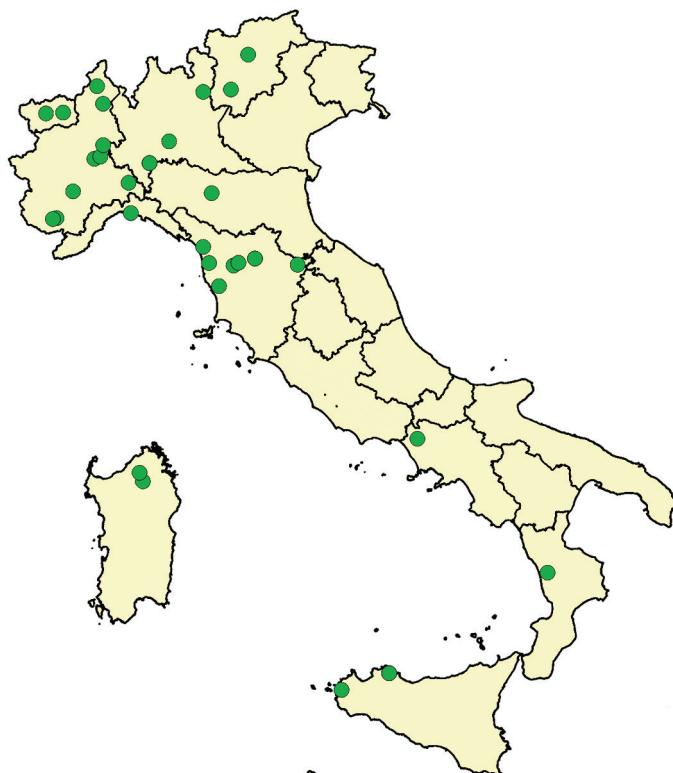
**Figure I.** Distribution of the 34 surveyed Italian private herbaria.

Table 2. Names and number of specimens preserved in the 34 Italian private herbaria resulted by present study.

Herbarium name as provided by owners	Nº of samples
<i>Herb. Antonietti</i>	20,000
<i>Erbario Soldano</i>	18,100
<i>Erbario Branchetti</i>	13,000
<i>Erbario Enzo Bona</i>	13,000
<i>Herb. Hözl Norbert</i>	12,300
<i>Herb. Ardingo e Franco Picco</i>	8,000
<i>Herbarium A. Ruggero</i>	5,000
<i>Herb. Domina</i>	5,000
<i>Herb. Dellavedova Roberto</i>	5,000
<i>Herbarium Meridianum-Collezione Maiorca-Caprio</i>	4,740
<i>Erbario Merli</i>	4,000
<i>Herb. Calvia</i>	4,000
<i>Herb. Nicola Ardenghi</i>	4,000
<i>Herb. Selvi</i>	3,600
<i>Herb. Croce</i>	3,500
<i>Erbario di Stefano Atzori</i>	3,500
<i>Herb. Cecchi</i>	3,273
<i>Herb. M. Bovio</i>	3,116
<i>Herb. Franco Giordana</i>	3,027
<i>Herbarium Varalda</i>	3,000
<i>Erbario Morelli</i>	2,500
<i>Herbarium Marco La Rosa</i>	2,085
<i>Herbario Gonnelli</i>	2,000
<i>Herbarium Braydense</i>	1,947
<i>HB. G.Pellegrino</i>	1,397
<i>HbGanz</i>	1,300
<i>Herb. Gianguzzi-Palermo</i>	1,200
<i>Herb. Giuseppe Cataldi</i>	1,123
<i>Herb. Tognon</i>	1,000
<i>Herb. Orsenigo</i>	1,000
<i>Erbario Trapanese</i>	800
<i>Herb. Roma-Marzio</i>	600
<i>Erbario Pascale</i>	315
<i>Herbarium Caetani</i>	38

The most represented families resulted Asteraceae (in 24 herbaria) and Poaceae (8 herbaria), whereas the most represented genera resulted *Carex* and *Trifolium* (in 4 herbaria respectively), followed by *Hieracium* (in 3 herbaria).

Regarding the availability to share their own data in a free and online database, 24 collectors (71%) have agreed to this proposal whereas, concerning citations of herbaria in a scientific paper, 29 herbaria (85%) were cited at least once.

Almost all herbaria (93%) have an associated database (41% in Excel, 37% in MS-Access, 7% in FileMaker and 7 % in MS Word, 4% in SQL-compliant DBMS and 4% in other systems); for 13 herbaria (38%) digital photos or scans of the specimens are available. As regards the arrangement of the collection, 16 (47%) collectors are adopting an alphabetical order, 10 (29%) follow Pignatti (1982), 3 other floras (1 Baroni 1907, 1 Fiori 1923–1929, and 1 Tutin et al. 1964–1980), 2 collectors (6%) adopted a geographic criterion, and 3 collectors (9%) did not report any criteria of ordination.

Pest problems afflicted 22 herbaria (65%) of which 13 (59%) show negligible, 9 (41%) intermediate, and none serious problems. About the solution adopted by collectors to prevent/control pests, 50% use freezing methods, 29% use chemical products (mainly para-dichlorobenzene and camphor), 6% a combination of freezing and chemical products and 5% do not adopt any pest control.

A cross-examination of these two questions (entity of the pest and adopted solution) revealed that private herbarium without treatment are always hit by medium (60%) to low (40%) pest problems. On the other hand, chemical treatment resulted slightly more efficient than freezing, whereas herbaria treated both with freezing and chemical treatment have no (65%) or only low (< 35%) pest problems (Figure 2).

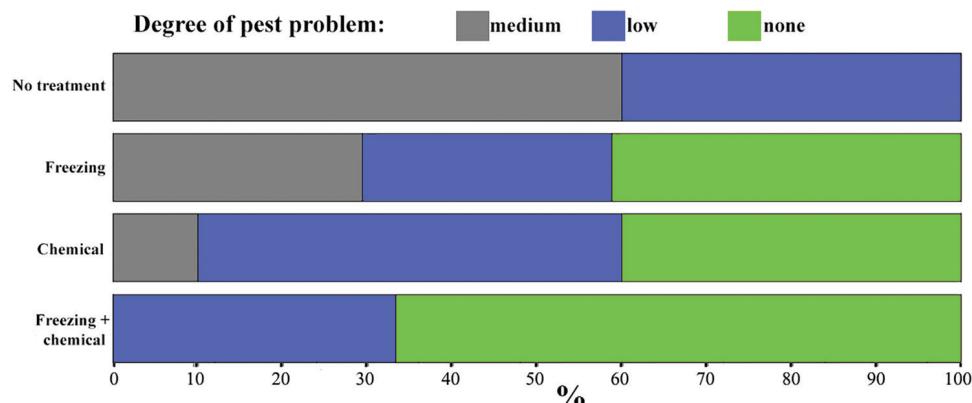


Figure 2. Stacked bar chart showing the relationship between the degree of pest problem and the treatments to prevent it in the Italian private herbaria.

Conclusions

Based on our investigation, about 156,000 specimens are currently preserved in Italian personal herbaria, making this “virtual” herbarium, taken all together, rank 16th among the 68 institutional public herbaria. A very preliminary bibliographic survey revealed that some private herbaria were recently cited in scientific papers (e.g. Anzalone et al. 2010, Iamonico 2015), although the owners did not answer to our survey. For this reason we infer that the real number of specimens preserved in the private collections in

Italy could reach 200,000 or more. For the same reason, the putative absence of private herbaria in central Italy resulting from our investigation could be an underestimation.

We hope that our survey can represent the starting point to re-evaluate the role and the importance of private plant collections, where a remarkable amount of valuable floristic data is currently preserved.

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Notulae to the Italian flora of algae, bryophytes, fungi and lichens: 3

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Abstract

In this contribution, new data concerning bryophytes, fungi and lichens and of the Italian flora are presented. It includes new records and confirmations for the bryophyte genera *Dicranodontium*, *Fontinalis*, *Lophocolea* and *Riccia*, the fungal genus *Diplolaeviopsis*, the lichen genera *Agonimia*, *Cladonia*, *Protoparmelia*, *Rhizocarpon*, and *Scytiunium*.

Keywords

Ascomycota, Bryidae, Marchantiidae, Jungermanniidae, floristic data

How to contribute

The text of the records should be submitted electronically to: Cecilia Totti (c.totti@uni-vpm.it) for algae, Annalena Cogoni (cogoni@unica.it) for bryophytes, Alfredo Vizzini (alfredo.vizzini@unito.it) for fungi, Sonia Ravera (sonia.ravera@unimol.it) for lichens.

Floristic records**BRYOPHYTES*****Dicranodontium denudatum* (Brid.) E.Britton (Leucobryaceae)**

+ **UMB:** Monte Serano (Perugia), in the Special Areas of Conservation (SAC) IT5210047 Monti Serano – Brunette (sommità) on humicolous slope in woodland (UTM WGS84: 33T 320531.47483336), 1340 m, 14 October 2013, S. Poponessi, M. Aleffi (BPERU). – Species new for the flora of Central Italy.

According to Aleffi et al. (2008), the presence in Italy of *Dicranodontium denudatum* is restricted to a number of northern localities. However, its occurrence in Veneto, Liguria, Emilia-Romagna, Toscana, Campania and Sardegna has not been confirmed over the last 50 years. The site in Umbria is characterized by the presence of Holm oak (*Quercus ilex* L.) woods. This record is also interesting because the reported altitudinal range of the species is generally lower in Europe, up to about 1000 m (Smith 2004, Poponessi et al. 2014). *Dicranodontium denudatum* does not seem to be widespread in the Mediterranean basin, but it is widely distributed in Europe, assigned to the European Boreal-montane floristic element. It usually grows on damp shaded rocks, decaying wood and peaty soil in woods and occasionally in open habitats (Smith 2004). *Dicranodontium denudatum* is a species threatened with extinction in several European countries: it is considered as Critically Endangered (CR) in Ireland, Vulnerable (VU) in Bulgaria and Endangered (EN) in Hungary. In Italy, the data are not sufficient for an assessment (Hodgetts 2015).

S. Poponessi, M. Aleffi, D. Gigante, R. Venanzoni

***Fontinalis hypnoides* C.Hartm. var. *duriaei* (Schimp.) Kindb. (Fontinalaceae)**

+ **VEN:** 400 m NW of Roversola, Oppeano, (Verona), in Fosso Ladretto, with *Potamogeton nodosus* Poir. (UTM WGS84: 32T 663016.5023250), 30 m, 23 October 2015, F. Prosser (Herb. Prosser No. 00084). – Species new for the flora of Veneto.

The only *Fontinalis* reported for Veneto is *F. antipyretica* Hedw. (Aleffi et al. 2008), from which *Fontinalis hypnoides* var. *duriaei* can be easily distinguished for the not keeled stem leaves. *Fontinalis hypnoides* var. *duriaei* differs from other Italian species for plane (not concave) stem leaves and for leaf margin without 1–4 rows of elongate cells. *Fontinalis hypnoides* var. *duriaei* is reported in northern Italy only for Lombardia, but not confirmed after 1950, and for Emilia-Romagna; it occurs also in Toscana, Lazio before 1950, Sardegna and Sicilia (Aleffi et al. 2008). The similar *F. hypnoides* var. *hypnoides* is reported in northern Italy only for Lombardia, but without confirmation after 1950. Unfortunately, we have no information about the population size of *F. hypnoides* var. *duriaei* and its diffusion near Roversola.

F. Prosser

Lophocolea bidentata (L.) Dumort. (Geocalycaceae)

+ VEN: Sass Negher (Belluno), near Serrai di Sottoguda Natural Reserve and Marmolada Glacier, groove in the rock (UTM WGS84: 32T 726144.5145940), 1403 m, 8 December 2016, S. Poponessi (PERU). – Species confirmed for the flora of Veneto.

Lophocolea bidentata is an austral-tropical montane liverwort species (Dierßen 2001). It has been widely recorded in central and northern Italy (Aleffi et al. 2008), but the last record in Veneto dates back to the early 1900s (Massalongo 1903). The area of occurrence is characterized by a moist gorge in a rocky dolomitic wall, along the border between beech and coniferous trees. Associate species include *Plagiopus oederianus* (Sw.) H.A.Crum. & L.E.Anderson var. *oederianus*, *Fissidens adianthoides* Hedw., *Nekera crispa* Hedw., *Jungermannia gracillima* Sm., *Cephalozia bicuspidata* (L.) Dumort., *Lejeunea cavifolia* (Ehrh.) Lindb. and *Ptychostomum pseudotriquetrum* (Hedw.) J.R.Spence & H.P.Ramsay var. *bimum* (taxon to be confirmed, according to Hodgetts 2015). Two ferns are also associate: *Asplenium ruta-muraria* L. subsp. *dolomiticum* Lovis & Reichst., and *Asplenium trichomanes* L. *Lophocolea bidentata* is widely distributed in Europe and is considered Vulnerable (VU) in Finland and Near Threatened (NT) in Italy (Hodgetts 2015).

S. Poponessi, M. Aleffi, D. Gigante, R. Venanzoni

Riccia cavernosa Hoffm. (Ricciaceae)

+ CAL: Lago Cecita (Cosenza), in the Sila National Park on muddy soil along the lakeshore (UTM WGS84 33S 630173.4358704), 1137 m, 13 September 2014, D. Puntillo (CLU No. 4090). – Species new for the flora of Calabria.

The species is recognizable for the perforations to the branch tips of the thallus and for their triangular-globular, polar spores incompletely reticulate. Distal face with

smooth, irregular low ridges, proximal face often granulate; covered with simple or branching ridges (Dierßen 2001). *Riccia cavernosa* normally lives on seasonally wet or flooded habitats. It is a cosmopolitan species widespread known in Europe and in the Mediterranean Basin (Ros et al. 2007, Hodgetts 2015). This species is known in Italy for Lombardia, Trentino-Alto Adige, Emilia Romagna, Abruzzo, Puglia and Sicilia (Aleffi et al. 2008). In Europe, it is assessed as Endangered (EN) in Norway and Austria, Vulnerable (VU) in Germany and Critically Endangered (CR) in Portugal and Switzerland (Hodgetts 2015).

D. Puntillo

FUNGI

Diplolaeviopsis ranula Giralt & D.Hawksw. (encoeliod-clade)

+ CAM: Gole del Bussento, Morigerati (Salerno), on *Lecanora strobilina* (Spreng.) Kieff. (UTM WGS84 33T 547000.4443740), 220 m, 28 July 1997, D. Puntillo (CLU No. 13436; dupl. Hb Diederich, Luxembourg). – Species new for the flora of Italy (Campania).

This species is a lichenicolous pycnidial coelomycete, commensal to pathogens on the apothecia and thalli of the *Lecanora strobilina* (Spreng.) Kieff. complex, and recognized by the characteristic 1(–2)-septate, often asymmetric, tadpole-shaped conidia (Giralt and Hawksworth 1991). This lichenicolous fungus is not included in the Italian preliminary check-list (Brackel 2016). It has been reported so far from France, Great Britain, Luxembourg, Portugal, Spain, Brazil and the USA, as associated with *Lecanora strobilina* and *Lecanora strobilinoides* Giralt & Gómez-Bolea (Giralt and Hawksworth 1991, Bicaud et al. 1992, Diederich et al. 1992, van den Boom and Giralt 1999, Earland-Bennett 1999, Diederich 2003, Hodkinson 2010). Its sexual morph has been recently described by Suija et al. (2015) and molecularly confirmed by Etayo et al. (2015). Phylogenetically it clusters in the encoeliod-clade (Helotiales) where it is sister to the genus *Macrosynttea* Etayo, Flakus, Suija & Kukwa (Etayo et al. 2015).

D. Puntillo, M. Puntillo, A. Vizzini

LICHENS

Agonimia octospora Coppins & P.James (Verrucariaceae)

+ CAM: Pisciotta (Salerno), on *Olea europaea* L. (UTM WGS84: 33T 519127.4440793), 230 m, 22 February 2011, leg. S. Ravera, G. Brunialti, det. S. Ravera (Herb. Ravera); Ottati (Salerno), on *Quercus ilex* L. (UTM WGS84: 33T 526762.4479360), 630 m,

12 April 2011, leg. S. Ravera, G. Brunialti, det. S. Ravera (Herb. Ravera). – Species new for the flora of Southern Italy (Campania).

Agonimia octospora is an epiphytic microlichen with squamulose thallus and more or less scattered perithecia, often sterile. Growing on basal parts of old trees, usually on bark among mosses, it is overlooked in the field not only for the small squamules of the thallus (0.05-0.25 × 0.05-0.12 mm). These two records confirm the scarce paleotolerance (Nimis 2016) of the species: both of the sites include undisturbed centenary trees in an olive orchard (Pisciotta) and in an old-growth wood (Ottati). *Agonimia octospora* is included in the national red list of epiphytic lichens as “Data Deficient” (Nascimbene et al. 2013).

S. Ravera

Agonimia opuntiella (Buschardt & Poelt) Vězda (Verrucariaceae)

+ **TOS:** Collina di Vinacciano, “via di Piastreta e Collina”, Serravalle Pistoiese (Pistoia), on *Quercus pubescens* Willd. (UTM WGS84: 32T 650152.4861724), 225 m, 22 August 2016, Z. Fačkovcová, L. Paoli (SIENA); Collina di Vinacciano, in the proximity of the cemetery of Vinacciano, Serravalle Pistoiese (Pistoia), on *Q. pubescens* (UTM WGS84: 32T 650153.4861118), 160 m, 22 August 2016, Z. Fačkovcová, L. Paoli (SIENA); “via Fornicione”, Serravalle Pistoiese (Pistoia), on *Q. pubescens* (UTM WGS84: 32T 652397.4861553), 65 m, 26 August 2016, Z. Fačkovcová, L. Paoli (SIENA). – Species confirmed for the flora of Toscana.

The species has a squamulose thallus, with minutely papillate and hairy surface. Due to the small dimensions, in the field it could be confused with young specimens of *Physconia servitii* (Nádv.) Poelt or *Phaeophyscia hirsuta* (Mereschk.) Essl. *Agonimia opuntiella* is rare and likely underestimated in Italy. A previous record in Toscana has been reported for the province of Grosseto, on *Olea europaea* L. (Brackel 2015).

L. Paoli, Z. Fačkovcová

Chaenotheca hispidula (Ach.) Zahlbr. (Coniocybaceae)

+ **ABR:** Vallevò, Rocca San Giovanni (Chieti), on bark of *Quercus pubescens* Mill. in Fosso della Farfalla (UTM WGS84: 33T 2476175.4681392), 69 m, 6 November 2010, S. Caporale, T. Pagliani, F. Piccoli, R. Verì (Herb. S. Caporale). – Species new for the flora of Abruzzo.

It is a cosmopolitan species, widely distributed in Europe from the Boreal to the Mediterranean-Mountain belt. In Italy it is found rarely and its presence was probably overestimated in the past (Zedda 2002). It colonizes preferentially cavities in the bark and at the base of old trees, especially oaks, in damp and non-eutrophic woods

(Nimis 2016). The presence of lichens belonging to the ‘Caliciales’ group is considered indicative of environmental quality and ecological continuity (Ravera and Puntillo 2014). It is included in the national red list of epiphytic lichens as “Near Threatened” (Nascimbene et al. 2013).

S. Caporale

Cladonia polycarpoidea Nyl. (Cladoniaceae)

+ **PIE:** Cascina Casone, Pombia (Novara), within the Natural Park Valle del Ticino, on sandy-pebbly soil in a dry grassland (UTM WGS84: 32T 475582.5054277), 172 m, 10 June 2016, *G. Gheza* (Herb. Gheza); Barbelera, Oleggio (Novara), within the Natural Park Valle del Ticino, on sandy-pebbly soil in a dry grassland (UTM WGS84: 32T 474874.5051835), 161 m, 21 April 2016, *G. Gheza* (Herb. Gheza); Marcketto, Oleggio (Novara), within the Natural Park Valle del Ticino, on sandy-pebbly soil in a dry grassland (UTM WGS84: 32T 475072.5051295), 158 m, 21 April 2016, *G. Gheza* (Herb. Gheza); Tenuta Bornago, Cameri (Novara), within the Natural Park Valle del Ticino, on sandy-pebbly soil in a dry grassland (UTM WGS84: 32T 476694.5044401), 141 m, 17 June 2016, *G. Gheza* (Herb. Gheza); Villa Giulia, Cerano (Novara), within the Natural Park Valle del Ticino, on sandy-pebbly soil in a dry grassland (UTM WGS84: 32T 487030.5027303), 99 m, 25 March 2016, *G. Gheza* (Herb. Gheza); surroundings of Canale Cavour, Greggio (Vercelli), near the boundary of the Natural Park Lame del Sesia, on soil in a pioneer dry grassland (UTM WGS84: 32T 452897.5034279), 167 m, 3 May 2016, *G. Gheza* (Herb. Gheza); Gerbido di Greggio (Vercelli), within the Natural Park Lame del Sesia, on soil in an evolved dry grassland (UTM WGS84: 32T 452849.5032860), 160 m, 4 March 2016, *G. Gheza* (Herb. Gheza); Gerbido di Villata (Vercelli), within the Natural Park Lame del Sesia, on sandy-pebbly soil in a dry grassland (UTM WGS84: 32T 453022.5026746), 138 m, 4 March 2016, *G. Gheza* (Herb. Gheza); Torrette di Frassineto, Frassineto Po (Alessandria), surroundings of the confluence between the rivers Sesia and Po, within the River Park “Parco fluviale del Po tratto vercellese/alessandrino e Riserva Naturale del Torrente Orba”, on sandy-silty soil in a dry grassland (UTM WGS84: 32T 467121.4998255), 99 m, 17 February 2016, *G. Gheza* (Herb. Gheza). – Species new for the flora of Piemonte.

+ **LOM:** Ansa di Castelnovate, Vizzola Ticino (Varese), within the Natural Park Valle del Ticino, on sandy soil in a dry grassland (UTM WGS84: 32T 473961.5052563), 164 m, 16 June 2016, *G. Gheza* (Herb. Gheza); surroundings of the Ticino river near Bernate Ticino (Milano), within the Natural Park Valle del Ticino, on sandy soil in a dry grassland (UTM WGS84: 32T 484052.5035066), 117 m, 25 March 2016, *G. Gheza* (Herb. Gheza); Tenuta La Fagiana, Pontevecchio di Magenta (Milano), within the Natural Park Valle del Ticino, on sandy soil in a dry grassland (UTM WGS84: 32T 486481.5030650), 109 m, 26 April 2016, *G. Gheza* (Herb. Gheza); Bosco Ron-

chi, Vigevano (Pavia), within the Natural Park Valle del Ticino, on sandy soil in a dry grassland (UTM WGS84: 32T 495866.5013406), 78 m, 30 May 2016, *G. Gheza* (Herb. Gheza). – Species confirmed for the flora of Lombardia.

Cladonia polycarpoidea is known from only few administrative regions in Italy (Nimis 2016). The only literature record in Lombardia, from the lower Valtellina (Rossi 1991), refers to a single site, while the species is new for Piemonte. On the basis of the new records reported here, which extend the Italian range of the species to the Po Plain, *C. polycarpoidea* seems to be well distributed in dry grasslands of the *Thero-Airion* Tüxen ex Oberdorfer 1957 located on acidic substrates along the course of two main rivers (Sesia and Ticino). It was always found in the *Cladonietum foliaceae* Klement 1953 emend. Drehwald 1993.

G. Gheza

Cladonia furcata (Huds.) Schrad. subsp. *subrangiformis* (L. Scriba ex Sandst.) Pišút (Cladoniaceae)

+ **PIE:** Portanuova, Casal Cermelli (Alessandria), surroundings of Cascina Merlana, on basic sandy-pebbly soil in a dry grassland (UTM WGS84: 32T 471806.4962778), 109 m, 10 May 2016, *G. Gheza*, *S. Assini* (Herb. Gheza); between Villalvernia and Cassano Spinola (Alessandria), bird ringing station near the Scrivia river, on calcareous sandy-pebbly soil (UTM WGS84: 32T 488531.4959878), 162 m, 14 April 2016, *G. Gheza*, *S. Assini* (Herb. Gheza); Gremiasco (Alessandria), surroundings of the Osservatorio Astronomico di Guardamonte, on sandstone outcrops (UTM WGS84: 32T 506270.4962306), 682-687 m, 9 December 2016, *G. Gheza* (Herb. Gheza). – Subspecies confirmed for the flora of Piemonte.

+ **LOM:** Cecima (Pavia), surroundings of the Osservatorio Astronomico di Guardamonte, on soil in a dry grassland (UTM WGS84: 32T 506264.4962342), 690 m, 9 December 2016, *G. Gheza* (Herb. Gheza); Fontana di Nivione, Varzi (Pavia), on clay soil on badlands (UTM WGS84: 32T 514388.4962082), 490-501 m, 10 November 2016, *G. Gheza*, *M. Barcella* (Herb. Gheza, Herb. Barcella); San Michele di Nivione, Varzi (Pavia), on calcareous soil (UTM WGS84: 32T 514671.4960675), 503-508 m, 10 November 2016, *G. Gheza*, *M. Barcella* (Herb. Gheza, Herb. Barcella); Cellà di Varzi (Pavia) surroundings of Castello Malaspina, on arenaceous soil (UTM WGS84: 32T 514394.4958621), 705-710 m, 10 November 2016, *G. Gheza*, *M. Barcella* (Herb. Gheza, Herb. Barcella). – Subspecies new for the flora of Lombardia.

+ **EMI:** Bobbio (Piacenza), ophiolite outcrop east of the mount Pan Perduto, on soil (UTM WGS84: 32T 528845.4963028), 995-997 m, 25 June 2013, *G. Gheza* (Herb. Gheza). – Subspecies confirmed for the flora of Emilia Romagna.

Cladonia furcata subsp. *subrangiformis* is a terricolous species found typically on basic-calcareous soil, with a rather continental distribution (Nimis 1993). It was previously known in two localities in Piemonte and three in Emilia Romagna (see literature cited

by Nimis 1993, 2016); moreover, all the records from Piemonte are very old. The new records reported here extend the range of the species to planitial calcareous dry grasslands located south of the Po river in Piemonte and to the Appennino Pavese in the southernmost part of Lombardia. The species seems rather common in terricolous cryptogam communities on pioneer calcareous, arenaceous and clayey substrates and, therefore, it is probably more widespread than believed until now in the northern Apennines, especially in lichen communities of the *Toninion sedifoliae* Hadač 1948 emend. Wirth 1995 on badlands, calcareous rock outcrops and similar substrates.

G. Gheza, M. Barcella, S. Assini

***Protoparmelia badia* (Hoffm.) Hafellner (Parmeliaceae)**

- + **BAS:** Cerro Falcone, Calvello (Potenza), on acid rock (UTM WGS84 33T 567960.4478689, 963 m. 7 August 2012, *G. Potenza, D. Puntillo* (CLU No. 16685).
– Species new for the flora of Basilicata.

Described by Hoffmann (1795) as *Verrucaria badia* and transferred to the genus *Lecanora* by Acharius (1810). Due to the placodioid thallus, the species was transferred to the genus *Protoparmelia* by Hafellner (1984). Bipolar species in alpine and mountainous areas of Europe, North America, Asia, South America, New Zealand and Antarctica. It grows on well-lit, hard, siliceous rocks. In Italy, it was recorded from Friuli to Sicily (Nimis 2016).

G. Potenza, D. Puntillo

***Rhizocarpon dinothetes* Hertel & Leuckert (Rhizocarpaceae)**

- + **SAR:** Monte Limbara (Olbia-Tempio), Multa Ragna, on siliceous rock, parasitic on *Protoparmelia montagnei* (Fr.) Poelt & Nimis (UTM WGS84: 32T 511531.4522312), 975 m, 3 September 2014, *W. v. Brackel, G. v. Brackel* (Herb. Brackel 7858). – Species confirmed for the flora of Sardegna.

This is the second report for Italy after that of R. Türk in 1986 at the Passo La Variante some kilometers away from the location of the recent find (Nimis and Poelt 1987). *Rhizocarpon dinothetes* lives parasitically on *Protoparmelia badia* (Hoffm.) Hafellner and *P. montagnei* on well-lit siliceous rocks. It is easily recognized by its allegiance to the host lichen, the bright greenish-yellow thallus, roundish, black, marginate apothecia and small (sub-)muriform ascospores of c. 13.5–24.5 × 8.5–11.5 µm. Except for Sardegna, it was known until now only from Austria and Spain.

W. von Brackel

Scytinium schraderi (Ach.) Otálora, P.M.Jørg. & Wedin (Collemataceae)

+ **PIE:** between Villalvernia and Cassano Spinola (Alessandria), bird ringing station near the Scrivia river, on calcareous sandy-pebbly soil (UTM WGS84: 32T 488531.4959878), 162 m, 5 May 2016, *G. Gheza* (Herb. Gheza). – Species confirmed for the flora of Piemonte.

+ **LOM:** Basella (Bergamo), in the Nature Reserve Basella-Malpaga, near the Serio river, on calcareous soil (UTM WGS84: 32T 557658.5051025), 182 m, 31 March 2016, *G. Gheza* (Herb. Gheza). – Species new for the flora of Lombardia.

Scytinium schraderi is a cyanolichen found on calcareous soil and rock. It was previously known for Piemonte and only from one locality (Nimis 2016), while it is new for Lombardia. The two sites described here are rather similar, being located in dry grasslands on calcareous substrates along the planitial course of two main rivers. *Scytinium schraderi* was sampled within rather pioneer stands of a lichen-moss community referable to the *Toninio-Psoretum decipientis* Stodick, 1973.

G. Gheza

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Notulae to the Italian native vascular flora: 3

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Abstract

In this contribution new data concerning the distribution of native vascular flora in Italy are presented. It includes new records, exclusions, and confirmations to the Italian administrative regions for taxa in the genera *Asplenium*, *Bolboschoenus*, *Botrychium*, *Chamaerops*, *Crocus*, *Galeopsis*, *Grafla*, *Helosciadium*, *Hieracium*, *Juniperus*, *Leucanthemum*, *Lolium*, *Medicago*, *Phalaris*, *Piptatherum*, *Potamogeton*, *Salicornia*, *Salvia*, *Seseli*, *Silene*, *Spiraea*, *Torilis* and *Vicia*. *Rhaponticooides calabrica* is proposed as *synonym novum* of *R. centaurium*. Furthermore, new combinations in the genera *Galatella* and *Lactuca* are proposed.

Keywords

Floristic data, Italy, new combinations, nomenclature

How to contribute

The text for the new records should be submitted electronically to Chiara Nepi (chiara.nepi@unifi.it). The corresponding specimen along with its scan or photograph have to be sent to FI Herbarium: Sezione di Botanica Filippo Parlatore del Museo di Storia Naturale, Via G. La Pira 4, 50121 Firenze (Italy). Those texts concerning nomenclatural novelties (typifications only for accepted names), status changes, exclusions, and confirmations should be submitted electronically to: Fabrizio Bartolucci (fabrizio.bartolucci@gmail.com). Each text should be within 2,000 characters (spaces included).

Floristic records

Asplenium septentrionale (L.) Hoffm. subsp. *septentrionale* (Aspleniaceae)

+ **LAZ:** Farnese (Viterbo), Selva del Lamone, località Voltamacine (UTM WGS84: 32T 720.4717), pleistocene basalt lava flow with irregular rocky blocks, varying from gray to black; bare or almost bare blocks, the latter covered only by some lichens and mosses; soil only in crevices; slope facing north with an average angle of 30°; elevation between 285 and 300 m a.s.l., 8 April 2016, L. Carotenuto, G. Salerno, G.A. Baragliu (FI). – Subspecies new for the flora of Lazio.

This species occurs in all the northern administrative regions, in Calabria, Basilicata, Sardegna, and Sicilia; in central Italy, it has been recorded only in Toscana (Conti et al. 2005). The population consists of a few dozens of tufts, growing in soil pockets inside the crevices; overall, it covers about 200 m². The site is included in the Natural Regional Reserve “Selva del Lamone” and in the Special Area of Conservation IT6010013 under EU Directive 92/43/CEE.

L. Carotenuto, G.A. Baragliu, G. Salerno

Bolboschoenus laticarpus Marhold, Hroudová, Ducháček & Zákr. (Cyperaceae)

+ **TOS:** Massarella (Fucecchio, Firenze), Padule di Fucecchio, (WGS84: 43.780018°N; 10.805349°E), area paludosa a Nord della Cavallaia, 15 m, no exp., 27 September 2016, L. Lastrucci, D. Viciani (FI). – Species new for the flora of Toscana.

It is a species with a broad ecological amplitude, growing on several habitat types, such as riverbanks, streams, channels or littoral areas of water reservoirs (Hroudová et al., 2007). In the study area, *Bolboschoenus laticarpus* forms wide stands in temporarily flooded areas, in contact with a *Phragmites australis* community.

L. Lastrucci, D. Viciani

Botrychium simplex E.Hitchc. (Ophioglossaceae)

+ **VEN:** Bosco Chiesanuova (Verona), Monti Lessini, presso Malga Podesteria, dintorni del rudere di Lo Stallone (WGS84: 45.704272°N; 11.038978°E), ripiano erboso sopra affioramento di Ammonitico, 1640 m, 1 July 2016, F. Prosser, G. Prosser, G. Prosser (FI). – Species new for the flora of Veneto.

Botrychium simplex was previously reported in Italy only for Trentino-Alto Adige (Conti et al. 2005), namely for the province of Trento (Marchetti 2004). An account of ancient and recent records from this province was given by Prosser (2000) and by Bertolli and Prosser (2014). Currently, only two growing areas are known in this prov-

ince. This species is listed in Annex II of the Directive 92/43/EEC. Both populations known in Trentino-Alto Adige are located outside Natura 2000 areas. On the contrary, the population on Mt. Lessini is located inside the Natura 2000 area of “Monti Lessini - Pasubio - Piccole Dolomiti Vicentine (IT3210040)” and, therefore, represents the only confirmed occurrence of the species within the Italian Natura 2000 network. The population found near Podesteria consists of about 10 individuals, growing together with *B. lunaria* (L.) Sw. (no intermediates were observed). We looked for further populations of *B. simplex* in the surroundings, but detected only many individuals of *B. lunaria*. Dibona (2012) reported *B. simplex* for the Sella Pass, on the side of Val Gardena (Bolzano), but the photograph represents *B. lunaria*.

F. Prosser

Chamaerops humilis L. (Arecaceae)

- + (CAS) **MOL:** Termoli (Campobasso), versante collinare sud del Vallone del Riovivo (WGS84: 41.995021°N; 14.995642°E), ca. m 27, 3 September 2016, N. Olivieri (FI).
– Casual alien species new for the flora of Molise.

Several individuals of different ages occur in a peripheral area of the City Park of Termoli, which occupies the final portion of the Valley of Riovivo. Individuals, mostly young, have settled on the southern slope of the valley, in the northwest exposed area, next to the Adriatic Sea and characterized by dry sandstone substrate. The plants have developed in a clearing of an artificial pine forest of *Pinus halepensis* Mill. and *P. pinaster* Aiton, covering the side of the valley. Owing to its adaptability to the Mediterranean phytoclimate, in Italy the species is widely used as an ornamental; in several cases, this has led to its spreading locally as an adventitious plant, e.g., in Friuli Venezia Giulia (Conti *et al.* 2005), Umbria (Ardenghi and Mossini 2013), Puglia (Buono and Manni 2013), Marche (Olivieri 2015a), and Abruzzo (Olivieri 2015b).

N. Olivieri

Crocus variegatus Hoppe & Hornsch. (Iridaceae)

- 0 **EMR.** nei monti di Parma, Jan 1842, Barbieri (FI! under the name *C. reticulatus*). – Species not recently confirmed for the flora of Emilia-Romagna.

Despite the very recent confirmation of the occurrence of *C. variegatus* in Emilia-Romagna by Bartolucci *et al.* (2016b), a closer re-examination of the specimen in PI led to its identification as *C. etruscus* Parl. (see below). The misidentification was due to the poor conservation status of the studied material in PI, which did not allow to confirm the presence of a prophyll (distinctive of *C. etruscus* and of the whole *C. sect. Crocus*). However, DNA analysis of the ITS region, carried out on leaf samples from the specimen in PI, definitely confirmed that the population from Boschi di Carrega

belongs to *C. etruscus*. On the other hand, we had the opportunity to examine in FI the specimen on which the historical record of *C. variegatus* for the region (Parlatore 1858, under the name *C. reticulatus*) was based, and it clearly refers to this species. Parlatore (1858) also suggested a possible error in the locality reported on the label.

Crocus etruscus Parl. (Iridaceae)

+ **EMR:** Sala Baganza (Parma), Boschi di Carrega (WGS84: 44.721914°N; 10.211219°E), 180–200 m, February 2016, Leg. S. Picollo, L. Ghillani, M. Adorni, det. L. Peruzzi (FI, PI under the name *C. variegatus* Hoppe & Hornsch.). – Species confirmed for the flora of Emilia-Romagna.

+ **UMB:** Città della Pieve (Perugia): vicinanze di C. Selve (WGS84: 42.938590°N; 12.039350°E), cerretta, suolo calcareo, 505 m, 20 Mar 2016, F. Falcinelli (PI); Città della Pieve (Perugia): tra C. Selve e Fso Nestore (WGS84: 42.935720°N; 12.044110°E), cerretta, suolo calcareo, 495 m, 20 Mar 2016, F. Falcinelli (FI). – Species new for the flora of Umbria.

The occurrence of this species in Emilia-Romagna is a matter of debate since a long time. Currently considered as a narrow endemic to Toscana (Carta et al. 2010, Harpke et al. 2015, Peruzzi et al. 2017), it was indeed doubtfully reported for Emilia-Romagna by Mathew (1982: “possibly also near Parma”), recorded by Alessandrini (1983), Alessandrini & Bonafede (1996), Alessandrini & Branchetti (1997), and Mazzoni et al. (2001) for several localities. Later, it was excluded from the regional flora by Carta et al. (2010) based on the confusion, documented in many cases, with the plants currently known as *C. neglectus* Peruzzi & Carta. However, more in-depth morphological and molecular investigations highlighted that the plants recently recorded as *C. variegatus* for Emilia-Romagna (Bartolucci et al. 2016b) actually belong to this species. On the contrary, *C. etruscus* was never recorded before in Umbria. The localities reported here considerably enlarge the range of this species, which is of particular conservational interest: it is protected under the Bern Convention, listed in Annex IVb of Habitat Directive (92/43/CEE), and appears in the IUCN Red List of Threatened species as *Near Threatened* (Carta & Peruzzi 2011).

L. Peruzzi, F. Falcinelli, D. Harpke, S. Picollo, L. Ghillani, M. Adorni

Crocus neglectus Peruzzi & Carta (Iridaceae)

+ **UMB:** Piegaro (Perugia): Montarale versante O (WGS84: 42.944830°N; 12.117920°E), cerretta, suolo calcareo, 850 m, 23 Mar 2016, F. Falcinelli (PI); Piegaro (Perugia): Montarale versante O (WGS84: 42.943850°N, 12.115850°E), cerretta, suolo calcareo, 830 m, 23 Mar 2016, F. Falcinelli (FI). – Species confirmed for the flora of Umbria.

According to Bartolucci et al. (2016b), this species was so far only historically recorded from Umbria.

F. Falcinelli, L. Peruzzi

***Galatella pannonica* (Jacq.) Galasso, Bartolucci & Ardenghi, comb. nov.**
urn:lsid:ipni.org:names:60474383-2

≡ *Aster pannonicus* Jacq., Hort. Bot. Vindob. 1(1): 3 (pl. 8). 1770 ≡ *Tripolium pannonicum* (Jacq.) Dobrocz., Fl. URSR 11: 63. 1962

***Galatella pannonica* (Jacq.) Galasso, Bartolucci & Ardenghi subsp. *tripolium* (L.) Galasso, Bartolucci & Ardenghi, comb. nov.**
urn:lsid:ipni.org:names:60474384-2

≡ *Aster tripolium* L., Sp. Pl. 2: 872(–873). 1753 [1.V.1753] ≡ *Tripolium pannonicum* (Jacq.) Dobrocz. subsp. *tripolium* (L.) Greuter, Willdenowia 33(1): 47. 2003 [29. VIII.2003]

Recent molecular studies (Li et al. 2012, Jafari et al. 2015) suggest the merging of the genus *Tripolium* Nees with *Galatella* Cass., although this result is not supported by anatomical and micro-morphological evidences (Karanović et al. 2015). Two members of *Tripolium* occur in Italy [*T. pannonicum* (Jacq.) Dobrocz. subsp. *pannonicum* and *T. sorrentinoi* (Tod.) Raimondo & Greuter], whereas a third [*T. pannonicum* subsp. *tripolium* (L.) Greuter] has been erroneously recorded in the past (Conti et al. 2007). Unlike *T. sorrentinoi* (≡ *Galatella sorrentinoi* Tod.), *T. pannonicum* subsp. *pannonicum* and subsp. *tripolium* are not provided with combinations in *Galatella*, which are here proposed.

G. Galasso, F. Bartolucci, N.M.G. Ardenghi

***Galeopsis angustifolia* Hoffm. subsp. *angustifolia* (Lamiaceae)**

+ **CAL:** Grisolìa (Cosenza), fiume Abatemarco alla Centrale (UTM WGS84: 33S 583.4400), brecciaio, 23 July 1993, L. Bernardo, N.G. Passalacqua (FI). – Subspecies new for the flora of Calabria.

L. Bernardo, G. Maiorca, L. Peruzzi, N.G. Passalacqua

***Grafia golaka* (Hacq.) Rchb. (Apiaceae)**

+ **CAL:** San Donato di Ninea (Cosenza), M. Mula, rupi del versante est (UTM WGS84: 33S 584.4395), 1870 m, 22 July 1991, L. Bernardo (FI). – Species new for the flora of Calabria.

N.G. Passalacqua, L. Peruzzi, G. Maiorca, L. Bernardo

Helosciadium inundatum (L.) W.D.J.Koch (Apiaceae)

+ **CAL:** Brognaturo (Vibo Valentia) Piana della Lacina, lungo il tubo collettore (UTM WGS84: 33S 622.4272), lungo linee di scorrimento del ruscello, 990 m, 18 July 1999, *L. Bernardo, D. Gargano* (FI). – Species new for the flora of Calabria.

N.G. Passalacqua, L. Peruzzi, G. Maiorca, L. Bernardo

Hieracium leiopogon Gren. ex Verl. subsp. *hyposericum* Zahn (Asteraceae)

+ **ITALIA (PIE):** Macra (Cuneo), Alpi Cozie, Valle Maira, presso il bivio per la fraz. Camoglieres (UTM WGS84: 32T 357.49291), pendio pietroso, calcare, 840 m, esp. S, 29 April 2015, *M. Pascale*, det. *G. Gottschlich* (FI, Herb. Pascale). – Subspecies new for the flora of Italy (Piemonte).

Pignatti (1982) reported *Hieracium leiopogon* Gren. ex Verl. for the Maritime Alps and Corsica. According to Conti et al. (2005, 2007), in Italy this species is found only in Sardegna. A reference to *H. leiopogon* subsp. *hyposericum* was made by Zahn (1916) for the Maritime Alps, however all the sites mentioned by this author are located on the French side. More recently, Greuter (2008) has reported the Sardinian populations as *H. leiopogon* subsp. *iolai* (Arrigoni) Greuter, excluding, at the same time, the presence of *H. leiopogon* subsp. *hyposericum* within Italian borders.

M. Pascale, G. Gottschlich

Juniperus oxycedrus L. (Cupressaceae)

+ **ABR:** Fresagrandinaria (Chieti), gessi, 14 February 1998, *F. Conti* (APP Nos. 34490, 34492; FI); Tufillo (Chieti), macchia, calcari marnosi, 22 February 1998, *F. Conti, A. Manzi* (APP Nos. 35438, 35439); Vittorito (L'Aquila), belvedere Peligno sopra Vittorito, cespuglieti, 23 April 2011, *F. Conti* (APP Nos. 55546, 55547, 55548). – Species new for the flora of Abruzzo.

F. Conti, F. Bartolucci

Lactuca sativa L. subsp. *serriola* (L.) Galasso, Banfi, Bartolucci & Ardenghi, comb. nov.
urn:lsid:ipni.org:names:77162537-1

≡ *Lactuca serriola* L., Cent. Pl. II.: 29. 1756 [2.VI.1756]

Molecular analyses conducted by Koopman et al. (2001) evidenced that no differences occur between *L. serriola* L., *L. sativa* L., *L. dregeana* DC. and *L. altaica* Fisch. &

C.A.Mey., which are probably conspecific. In particular, *L. sativa* is a culton (*sensu* Hettterscheid and Brandenburg 1995) of *L. serriola* domesticated in Egypt (Vries 1997). Thus, according to the approach adopted within the new checklist of the Italian vascular flora (Bartolucci et al. 2016c, Galasso et al. 2016) with respect to wild taxa belonging to the same species of the domesticated ones [see e.g. *Beta vulgaris* L. subsp. *maritima* (L.) Arcang., *Pyrus communis* L. subsp. *pyraster* (L.) Ehrh.], we here propose a new nomenclatural combination for relocating *L. serriola* as a subspecies of *L. sativa*. A former combination at the same rank appeared within a doctoral thesis (Frietema de Vries 1996), but was not published in accordance with Art. 30.8 of the ICN (McNeill et al. 2012).

G. Galasso, E. Banfi, F. Bartolucci, N.M.G. Ardenghi

Leucanthemum ligusticum Marchetti, R.Bernardello, Melai & Peruzzi (Asteraceae)

– **EMR.** – Species to be excluded from the flora of Emilia-Romagna.

Leucanthemum legraeanum (Rouy) B.Bock & J.-M.Tison (Asteraceae)

+ **EMR:** Bedonia (Parma), Segno Rosso di Val Gorotta (WGS84: 44.475964°N; 9.581916°E), radura con affioramenti rocciosi, 800 m, 12 August 2010, M. Adorni, A. Alessandrini, L. Ghillani (FI). – Species new for the flora of Emilia-Romagna.

Leucanthemum ligusticum Marchetti, R.Bernardello, Melai & Peruzzi was recently recorded as new for the flora of Emilia-Romagna based on a specimen collected in Val Gorotta and stored in FI (Bartolucci et al. 2016b). After the revision of the herbarium specimen cited above, the population of Emilia-Romagna has to be attributed to the closely related *Leucanthemum legraeanum*, a species recently recorded for the first time in Italy (Bernardello et al. 2015).

D. Marchetti, M. Adorni, A. Alessandrini, L. Ghillani

Lolium pratense (Huds.) Darbysh. (Poaceae)

– **PUG.** – Species to be excluded from the flora of Puglia.

In Puglia, *Lolium pratense* s.l. [incl. *L. apenninum* (De Not.) Ardenghi & Foggi] was recorded for Gargano [Biscotti 2002 sub *Festuca pratensis* Huds., Licht 2008 sub *Schedonorus pratensis* (Huds.) P.Beauv.] and Salento (Mele et al. 2006 sub *Festuca pratensis* Huds.). Biscotti (2002) and Licht (2008) referred to a single collection from 1952 by A. Messeri [Fenaroli 1974 sub “*Festuca elatior* L. = *F. elatior* L. *pratensis* (Huds.) Fiori”]. We traced Messeri’s collection in BI (Gargano, S. Giov. Rotondo, Contrada Campolato, Masseria Corvara, 5 June 1952, leg. Messeri). The plants on the sheet are

actually *Lolium arundinaceum* (Schreb.) Darbysh. In BI, we traced another collection sub “*Festuca pratensis* Hudson” (Campus Universitario di Bari, 11 January 1991, leg. M. Fontanella), also referable to *L. arundinaceum*. In Salento, *L. pratense* was recorded by Mele et al. (2006) in the city of Lecce, but confused it with *L. arundinaceum* (specimen in LEC!). Lastly, a report under *Festuca elatior* L. from the Daunian subapennine (Trotter and Romano 1914), that we could not verify, is probably to be referred to *L. arundinaceum*, too.

R.P. Wagensommer, P. Medagli, L. Forte

Medicago muricoleptis Tineo (Fabaceae)

+ **CAL:** Crosia (Cosenza), pascolo a sinistra del Trionto (UTM WGS84: 33S 650.4381), 100 m, 15 May 1991, *L. Bernardo* (FI). – Species new for the flora of Calabria.

L. Bernardo, G. Maiorca, L. Peruzzi, N.G. Passalacqua

Phalaris brachystachys Link (Poaceae)

+ **BAS:** Matera (Matera), Bosco di Lucignano, ca. 185 m SW dalla Cisterna di San Francesco (WGS84: 40.60691°N; 16.70310°E), campo di grano duro, con *Avena sterilis* subsp. *ludoviciana*, *Glebionis segetum*, *Anchusa azurea*, 363 m, 9 June 2016, *N. Ardenghi, P. Cauzzi* (FI). – Species confirmed for the flora of Basilicata.

The presence of *Phalaris brachystachys* in Basilicata was regarded as doubtful by Conti et al. (2005); the species was discovered by the authors within a durum wheat field.

N.M.G. Ardenghi, P. Cauzzi, F. Guzzon

Piptatherum holciforme (M.Bieb.) Roem. & Schult. subsp. *holciforme* (Poaceae)

+ **BAS:** Matera, Gravina di Matera (WGS84: 40.6747°N; 16.6262°E), su rupi calcaree, 400 m, 15 May 2006, *F.S. D'Amico, M. Terzi* (FI, BI) – Subspecies new for the flora of Basilicata.

+ **PUG:** Laterza (Taranto), Gravina di Laterza (WGS84: 40.6165°N; 16.8094°E), rupi calcaree, 320 m, 8 June 2006, *M. Terzi, F.S. D'Amico* (FI); Laterza (Taranto), Gravina di Laterza, ambiente rupicolo - mosaico tra macchia ed incolto, 14 May 2010, *E.V. Perrino* (BI); Laterza (Taranto), Gravina di Laterza, ambiente rupicolo e radure a macchia, 1 June 2010, *F. Mantino, F. Carruggio* (BI) – Subspecies new for the flora of Puglia.

The distribution area of *Piptatherum holciforme* includes the E-Mediterranean Basin, SE Europe, C-Asia, up to the Arabian Peninsula, Ethiopia and Eritrea in Africa

(Clayton et al. 2017). According to Clayton et al. (2017), the species includes three subspecies: *P. holciforme* subsp. *abyssinicum* Freitag, restricted to Ethiopia, Eritrea and Arabian Peninsula, *P. holciforme* subsp. *longiglume* (Hausskn.) Freitag and *P. holciforme* subsp. *holciforme*. The last two subspecies occur in Europe (Valdés et al. 2009). In Italy, *P. holciforme* was recorded for Puglia and Basilicata where it was found in karstic canyons near Laterza (Taranto) and Matera (D'Amico and Terzi 2007, Terzi and D'Amico 2009). Based on the taxonomic revisions by Freitag (1975), the main differences between *P. holciforme* subsp. *holciforme* and *P. holciforme* subsp. *longiglume* are represented by the length of the spikelet (7–10 mm vs. 9–14 mm), lemma (5–6 mm vs. 7–8 mm), and awn (5–8 mm vs. 11–14 mm). Similar differences between the two subspecies were recorded in Iran where both subspecies occur (Hamzeh'ee and Assadi 2015). The specimens collected in Puglia and Basilicata have a spikelet of 10–11 mm, a lemma of 5–6 mm, and an awn of nearly 10 mm. According to Freitag (1975), lemma size is the most reliable character to differentiate the two subspecies. Therefore, the Italian populations are here assigned to the nominal subspecies.

M. Terzi, F.S. D'Amico, R.P. Wagensommer

Potamogeton schweinfurthii A.Benn.

+ **EMR:** Montetiffi (Sogliano al Rubicone, Forlì-Cesena), (WGS84: 43.941194°N; 12.283153°E), laghetto artificiale, 27 October 2016, G. Faggi (FI). – Species new for the flora of Emilia-Romagna.

The Italian distribution of this species was described recently by Lastrucci et al. (2010) and subsequently some updates for Marche came from Gubellini et al. (2014). These authors pointed out that this species was often confused with other entities of the genus *Potamogeton*, especially *Potamogeton lucens* L. In the study area, the species grows in an artificial pond showing only submerged leaves, as reported also for other Italian sites by Lastrucci et al. (2010).

The first notice of this discovery appeared in the web-forum Acta Plantarum (<http://www.actaplantarum.org/floraitaliae/viewtopic.php?f=109&t=92374>).

L. Lastrucci, G. Faggi, A. Alessandrini

Rhaponticoides centaurium (L.) M.V.Agab. & Greuter

= *Rhaponticoides calabrica* Puntillo & Peruzzi, Folia Geobot. 44(2): 192 (2009) **syn. nov.**

Rhaponticoides calabrica was described as a new species based on putative differences in chromosome number, capitula floret colour, and width of the scarious margin of the phyllaries as compared with *R. centaurium* (L.) M.V.Agab. & Greuter (Puntillo

& Peruzzi 2009). However, all these differences later turned out to be inconsistent. *R. calabrica* was reported as having $2n = 30$ (Puntillo & Peruzzi 2009), while *R. centaurium* $2n = 26$ (Bianco et al. 1990), until Peruzzi & Perrino (2012) proved this count to be wrong, and to correspond to that of *R. calabrica* ($2n = 30$). Florets were described as whitish-rose in *R. calabrica* (Puntillo & Peruzzi 2009) and purple in *R. centaurium* (Dostál 1976, Pignatti 1982), but the standard descriptions of the latter species in the floras proved to be wrong, since *R. centaurium* also has whitish-rose florets (Fascetti et al. 2014). Accordingly, the only remaining morphological feature concerns the phyllary scarious margins (putatively wider in *R. calabrica*). However, according to Fascetti et al. (2014), also this feature is controversial, and seemingly rather homogeneous among all localities from Basilicata (where both species should allopatrically occur, according to Puntillo & Peruzzi 2009). All in all, the treatment of *R. calabrica* as a heterotypic synonym of *R. centaurium* better conforms to our current knowledge on the systematics of this biological unit.

L. Peruzzi

Salicornia veneta Pignatti & Lausi (Amaranthaceae)

+ **MAR:** Porto d'Ascoli (San Benedetto del Tronto), Sentina Natural Regional Reserve (UTM WGS84: 33T 410.4750), in small clearing on clay-loam soil in the most depressed areas in the retrodunal zone with direct seawater access, 29 December 2016, E. Biondi, R. Gasparri, S. Casavecchia, M.A. Crisanti (FI, ANC). – Species new for the flora of Marche.

Salicornia veneta was recorded for Friuli Venezia Giulia, Veneto, Emilia-Romagna, Puglia and Sardegna (Conti et al. 2005, Biondi and Casavecchia 2010). It was recently found also in Croatia (Stari Grad, Isola di Rab; Šajna et al. 2013). In the Sentina Natural Regional Reserve, the occurrence of *S. emerici* Duval-Jouve is also indicated (Conti et al. 2007, 2013), regarded by Kadereit et al. (2012) as a synonym of *S. procumbens* Sm. subsp. *procumbens*. The latter authors also consider *S. veneta* as synonym of *S. procumbens*, while Iberite and Iamonico (2016), based on morphological studies, consider *S. veneta* as a distinct unit.

E. Biondi, R. Gasparri, S. Casavecchia, M.A. Crisanti

Salvia officinalis L. subsp. *gallica* (W.Lippert) Reales, D.Rivera & Obón (Lamiaceae)

+ **ITALIA (TOS):** Santa Liberata sul Monte Argentario (Grosseto), In locis ± incultis subspontanea (UTM WGS84: 32T 677.4700), 12 May 1894, Sommier (FI); In promontorio Argentario (Grosseto), ± coltivata (UTM WGS84: 32T 676.4694), 29 March 1902, Sommier (FI); Giglio (Livorno), inselvaticchita (UTM WGS84: 32T

656.4688), 7 March 1897, Sommier (FI); Elba (Livorno), lungo la strada e i fossi, vicino al bivio Portoferraio-Capoliveri (UTM WGS84: 32T 609.4738), 1 October 1964, Fabbri, Bavazzano, Contardo (FI); Montecristo (Livorno), s.l. (UTM WGS84: 32T 607.4684), 30 December 1897, Doria, Béguinot (FI). – Subspecies new for the flora of Italy (Toscana).

This subspecies was reported for the island of Montecristo (Tuscan Archipelago) and Argentario (probably based on some of the above mentioned specimens) by Reales et al. (2004) in their taxonomic study on the genus *Salvia* sect. *Salvia*, but not included in the works of Conti et al. (2005, 2007). Formerly it was reported as *S. officinalis* L. for the Tuscan Archipelago and Argentario by several authors (Caruel 1860–1864, Baroni 1897–1908, Sommier 1900, 1902, 1903, Béguinot 1901, Paoli and Romagnoli 1976, Fossi Innamorati 1989, Baldini 1995, 1998, Bertacchi et al. 2005). Sommier (1902) did not include this species in the Montecristo island flora because he did not consider it as truly native. It is not certain whether this taxon is (or was) native in this area or if it is derived from cultivation, i.e., an alien plant that became subspontaneous-casual in wildlands, at least in Elba and Argentario. It is worth noting that this subspecies is (or was) only present in some islands of the Tuscan Archipelago and in Argentario, now a coastal promontory but once an island of the ancient Tuscan Archipelago. Several exsiccata of *Salvia officinalis* are conserved at FI and the species was also reported for other Tuscan sites (Caruel 1860–1864, 1870, Del Prete et al. 1991, Camangi and Tomei 2003, Bertacchi et al. 2005, Garbari and Borzatti Von Loewenstein 2006, Pierini et al. 2009), but always considering it as cultivated or derived from cultivation. The only regional site where it seems to be native is Mt. Cetona, in SE Toscana (Bonari 2014).

N.G. Passalacqua, D. Viciani

Seseli polyphyllum Ten. (Apiaceae)

≡ *Seseli montanum* L. subsp. *polyphyllum* (Ten.) P.W.Ball

– LAZ. – Species to be excluded from the flora of Lazio.

Anzalone et al. (2010) recorded *Seseli polyphyllum* Ten. for Lazio based on a specimen collected on the Ausoni Mountains (M. Arcano [M. S. Biagio], 5 April 1988, leg. et det. E. Lattanzi, rev. B. Anzalone, Herb. Lattanzi). This exsiccatum was recently revised and identified as *Seseli montanum* L. subsp. *montanum* (rev. A. Stinca et M. Ricciardi, 15 February 2014). In Lazio, *S. polyphyllum* was anciently reported only for the Lepini Mountains at “Vetta della Semprevisa” (Béguinot 1897, under the name *S. montanum* L. var. *polyphyllum* Ten.). This record is not attested by any exsiccatum collected by Béguinot. Actually, in GE (S. Peccenini in litt.), GDOR (M. Tavano in litt.)

and PAD (R. Marcucci in litt.) there is no Béguinot specimen referring to this taxon. Accordingly, this species occurs only in Campania, where it has been recorded for the Sorrento peninsula (Caputo et al. 1994), island of Capri (Ricciardi 1998) and Partenio mountains (Moraldo and La Valva 1989). Therefore, *S. polyphyllum* is to be excluded from Lazio.

A. Stinca, M. Ricciardi, E. Lattanzi

***Silene mutabilis* L. (Caryophyllaceae)**

+ **CAL:** Calabria, Tarsia (Cosenza), C.da Cona, cavalcavia autostradale ca. 500 m a sud di Conicella (WGS84: 39.61850°N; 16.22998°E), margine strada, 156 m, 28 August 2016, L. Peruzzi (PI, FI). – Species new for the flora of Calabria.

Silene mutabilis is an annual SW Mediterranean species, previously known as *S. neglecta* Ten. (Pignatti 1982, Peruzzi and Carta 2013, Bacchetta et al. 2014, Peruzzi et al. 2014). It was hitherto known for Italy in Toscana, Lazio, Abruzzo, Campania, Basilicata, and Sicilia (Pignatti 1982, Conti et al. 2005).

L. Peruzzi

***Spiraea decumbens* W.D.J.Koch subsp. *tomentosa* (Poech) Dostál (Rosaceae)**

+ **TAA:** Val delle Moneghe, comune di Sagron Mis (Trento), a monte del termine della strada forestale (WGS84: 46.181192°N; 11.948722°E), su una singola piccola rupe spiovente alcune decine di esemplari ancora lontani dalla fioritura, 1190 m, 27 May 2016, A. Bertolli, F. Prosser, G. Tomasi (FI, ROV). – Subspecies new for the flora of Trentino-Alto Adige.

Spiraea decumbens subsp. *tomentosa* is an Italian endemic, previously known only in Veneto and Friuli Venezia Giulia (Peruzzi et al. 2014). Its local distribution is reported by Poldini (2002) for Friuli Venezia Giulia and by Argenti and Lasen (2001) for Veneto. The map in Argenti and Lasen (2001) shows occurrences not far from the boundary between Veneto and Trentino. When we visited the Mis Valley in the Veneto Prealps, we were impressed by the rich populations of *Spiraea decumbens* subsp. *tomentosa* up to 2-3 km from the boundary of Trentino. For this reason, some days later we looked for this plant on the first cliff belt inside the Trento territory and we found the small population described above. The area was previously well investigated (Festi and Prosser 2000), but targeted research led to this unexpected finding.

A. Bertolli, F. Prosser

***Torilis nodosa* (L.) Gaertn. subsp. *webbii* (Jury) Kerguélen (Apiaceae)**

+ **CAL:** Copanello di Stalettì (Catanzaro), Terrazzo (UTM WGS84: 33S 636.4291), 28 April 1995, S. Tassone (FI). – Subspecies new for the flora of Calabria.

N.G. Passalacqua, L. Peruzzi, G. Maiorca, L. Bernardo

***Vicia ervoides* (Brign.) Hampe (Fabaceae)**

+ **CAL:** S. Donato di Ninea (Cosenza), Piano di Marco, alla base del Monte Mula (UTM WGS84: 33S 585.4395), radure di cerreta, 1050 m, 14 July 1994, L. Bernardo, N.G. Passalacqua (FI). – Species new for the flora of Calabria.

L. Bernardo, G. Maiorca, L. Peruzzi, N.G. Passalacqua

***Vicia serratifolia* Jacq. (Fabaceae)**

+ **ABR:** Cansano (L'Aquila), Piano Cerreto (WGS84: 41.979644°N; 14.059860°E), inculti e prati aridi, 1030 m, 18 May 2016, F. Bartolucci, L. Di Martino, V. Di Cecco (APP No. 57755, FI). – Species new for the flora of Abruzzo.

Vicia serratifolia certainly occurs in southern Italy, Lazio, Emilia-Romagna, and Lombardia whereas it was historically recorded in Campania and is doubtful in Toscana (Conti et. al 2005, Giardina et. al. 2007, Marzorati et al. 2013, Wagensommer et al. 2014, Ardenghi and Polani 2016, Bartolucci et al. 2016a). *Vicia serratifolia* is listed in Conti et al. (2005) as *V. narbonensis* L. subsp. *serratifolia* (Jacq.) Ces., but it is clearly distinct from *V. narbonensis* L. by the number of teeth on leaves, shape of stipules, and number of flowers. Therefore, also according to Schäfer (1973), Bennet and Maxted (1997), and Tison and De Foucault (2014), we prefer to regard it as a distinct species.

F. Bartolucci, L. Di Martino, V. Di Cecco, F. Conti

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Abstract

In this contribution, new data concerning the Italian distribution of alien vascular flora are presented. It includes new records, exclusions, confirmations, and status changes for Italy or for Italian administrative regions for taxa in the genera *Acer*, *Amaranthus*, *Araujia*, *Aubrieta*, *Avena*, *Bidens*, *Calycanthus*, *Celtis*, *Elaeagnus*, *Eragrostis*, *Euonymus*, *Fallopia*, *Ficus*, *Hedera*, *Lantana*, *Ligustrum*, *Ludwigia*, *Morus*, *Oenothera*, *Opuntia*, *Oxalis*, *Parkinsonia*, *Paspalum*, *Paulownia*, *Platycladus*, *Pleuropteris*, *Rumex*, *Salvia*, *Senecio*, *Setaria*, *Syagrus*, *Tradescantia*, *Trifolium* and *Yucca*. Furthermore, a new combination in the genus *Vicia* is proposed.

Keywords

Floristic data, Italy, new combination

How to contribute

The text for the new records should be submitted electronically to Chiara Nepi (chiara.nepi@unifi.it). The corresponding specimen along with its scan or photograph has to be sent to FI Herbarium: Sezione di Botanica Filippo Parlatore del Museo di Storia Naturale, Via G. La Pira 4, 50121 Firenze (Italy). Those texts concerning nomenclatural novelties (typifications only for accepted names), status changes, exclusions, and confirmations should be submitted electronically to: Gabriele Galasso (gabriele.galasso@comune.milano.it). Each text should be within 2,000 characters (spaces included).

Floristic records

Acer negundo L. (Sapindaceae)

+ (CAS) **PUG**: Maglie (Lecce), margine del parco pubblico “Villa Achille Tamborino” (WGS84: 40.117286°N; 18.299727°E), siepi e radure, ca. 82 m, 20 August 2016, *N. Olivieri* (FI). – Casual alien species new for the flora of Puglia.

Several young individuals of the species, some higher than 2 m, grow at the margins of an urban park, inside hedges of *Laurus nobilis* L. and in clearings of *Quercus ilex* L. subsp. *ilex*. The specimens have developed in a partially shaded position, on dry, brown, calcareous luvisol covered by evergreen oak litter. They derive from wind-dispersed samaras produced by trees cultivated in the park.

N. Olivieri

Amaranthus ×ozanonii Thell. (Amaranthaceae)

+ (CAS) **CAL**: Oriolo (Cosenza), C.da Scalapitta nei pressi del Torrente Scalapitto (WGS84: 40.040365°N; 16.451603°E), incolto al margine di una strada sterrata, 325 m, 24 August 2016, *F. Roma-Marzio* (FI). – Casual alien nothospecies new for the flora of Calabria.

This hybrid between *Amaranthus hybridus* L. and *A. retroflexus* L. is probably native to Europe (Iamonico 2015). In Oriolo it is represented by many plants occupying uncultivated land at the margin of a dirt road.

F. Roma-Marzio, D. Iamonico

Araujia sericifera Brot. (Apocynaceae)

+ (CAS) **MOL**: Termoli (Campobasso), versante collinare S del Vallone del Rioivo (WGS84: 41.994961°N; 14.995788°E), pineta artificiale, ca. 27 m, 3 September 2016, *N. Olivieri* (FI). – Casual alien species new for the flora of Molise.

The species is represented by a small number of individuals in the undergrowth of an artificial pine forest composed mostly of *Pinus halepensis* Mill. subsp. *halepensis* and *P. pinaster* Aiton subsp. *escarena* (Risso) K.Richt., in the urban park of Termoli near the Adriatic coast. Plants grow in partial shade, on sandstone soil covered by a herbaceous vegetation typical of disturbed areas.

N. Olivieri

Aubrieta deltoidea (L.) DC. (Brassicaceae)

= *Aubrieta × cultorum* Bergmans

+ (CAS) **TAA**: Pieve Tesino (Trento), walls of the town centre (WGS84: 46.069459°N; 11.609140°E), stone and cement walls, 850 m, S, 27 June 2016, G. Mei (FI, ANC, Herb. G. Mei). – Casual alien species new for the flora of Trentino-Alto Adige.

The species is widely cultivated as ornamental and is naturalized in southern and western Europe, widespread in Spain, France, Switzerland, England, Greece and the Balkans. The population of Pieve Tesino is interesting for its abundant fructification, for the presence of individuals of different ages and for the presence of seedlings. These features can be interpreted as the possible start of a future naturalization of the species.

G. Mei

Avena atherantha C.Presl (Poaceae)

+ (NAT) **MAR**: Potenza Picena (Macerata), Autostrada “Adriatica” A14, a S di C.da Terranova (WGS84: 43.384741°N; 13.680887°E), scarpata stradale, con *Sambucus ebulus*, *Arundo donax*, *Urtica dioica*, 8 m, 30 May 2016, N. Ardenghi, P. Cauzzi, F. Guzzon (FI). – Naturalized cryptogenic species confirmed for the flora of Marche.

A large population was detected growing on the motorway embankment; further stands (impossible to sample due to their unsafe location) were observed along Autostrada A14 in the same area. The species was first reported for this region by Ballelli (2002), but the record was not taken into account by Gubellini (2005, 2009).

N.M.G. Ardenghi, P. Cauzzi, F. Guzzon

Avena sativa L. subsp. *byzantina* (K.Koch) Romero Zarco (Poaceae)

+ (CAS) **BAS**: Matera (Matera), tra Masseria di Pietrapenta e Strada Provinciale Papalione (WGS84: 40.631968°N; 16.545906°E), margine di sterrata, con *Avena barbata* e *Dasypyrum villosum*, 150 m, 9 June 2016, N. Ardenghi, P. Cauzzi (FI). – Casual alien species new for the flora of Basilicata.

About 100 individuals were observed on the edges of an unsurfaced road.

N.M.G. Ardenghi, P. Cauzzi, F. Guzzon

Bidens aurea (Aiton) Sherff (Asteraceae)

+ (NAT) **PUG**: San Nicandro Garganico (Foggia), presso San Giuseppe (Km 20 della Strada Provinciale) (WGS84: 41.823250°N; 15.549489°E), cunette stradali, 250 m, 6 December 1987, *F. Pantaleo* (RO–Anzalone–3688); *ibidem*, presso “San Giuseppe” (WGS84: 41.823250°N; 15.549489°E), cunette stradali, 250 m, 23 November 1988, *F. Pantaleo* (RO–Anzalone–3689 sub *Bidens* sp.); *ibidem*, a W del paese, all’inizio della strada per San Marco in Lamis (WGS84: 41.823250°N; 15.549489°E), cunetta stradale, 250 m, 27 October 2016, *R.P. Wagensommer* (FI, *Herb.* *R.P. Wagensommer*).
 – Naturalized alien species new for the flora of Puglia.

In Italy, *Bidens aurea* is already known in Veneto, Toscana, Sicilia (Conti et al. 2005, 2007), Calabria (Bernardo et al. 2009), Lazio (Ceschin et al. 2010), Campania (Rosati et al. 2012), and Sardegna (Podda et al. 2012). During the digitization of the *B. Anzalone herbarium* in RO (Iberite et al. 2010), we found sheets collected almost 30 years ago in Puglia, on the Gargano Promontory, near San Nicandro Garganico. A field trip allowed us to confirm that the species is still present in the same locality, covering a small area of about 5 m², with no evidence of invasiveness.

G. Nicolella, M. Latini, R.P. Wagensommer, M. Iberite

Calycanthus floridus L. (Calycanthaceae)

+ (CAS) **ITALIA (TOS)**: Seravezza (Lucca), valle del Torrente Serra, lungo la strada per Azzano, poco dopo la loc. Desiata (WGS84: 44.025840°N; 10.221460°E), casuale lungo la scarpata stradale, 216 m, 8 June 2016, *G. Ferretti, M. Gennai*, det. *G. Ferretti* (FI). – Casual alien species new for the flora of Italy (Toscana).

Calycanthus floridus is native to North America and cultivated in Italy as ornamental. A spontaneous population on an area of approximately 50 m² was found on the way to Azzano on the Apuan Alps, on a slope at the road edge. The population is probably originated from a plant once cultivated nearby. The specimens were identified according to Johnson (1997).

G. Ferretti, M. Gennai

Celtis occidentalis L. (Cannabaceae)

+ (CAS) **ABR**: Teramo (Teramo), loc. Coste di Sant’Agostino, lungo Via A. De Gasperi (WGS84: 42.663697°N; 13.703552°E), margine stradale, ca. 270 m, SW, 27 August 2016, *N. Olivieri* (FI). – Casual alien species new for the flora of Abruzzo.

A young individual, about 2 m high, grows at the road edge, along the northern side of the Vezzola River valley covered by disturbed shrub vegetation. The location is outside the urban area and is characterized by pelitic-arenaceous sedimentary substrate. The vegetation consists of *Robinia pseudoacacia* L., *Rubus ulmifolius* Schott, *Ailanthus altissima* (Mill.) Swingle, *Hedera helix* L., *Ulmus minor* Mill., *Artemisia verlotiorum* Lamotte and *Inula conyzae* (Griess.) DC. There are no trees of *C. occidentalis* nearby, so the plant could be derived from a seed dispersed by endozoochory, since its fleshy drupes are eaten by birds. Until now the species has been reported in Italy from Piemonte, Lombardia, Veneto, Trentino-Alto Adige (Celesti-Grapow et al. 2009), and Emilia-Romagna (Bracchi and Romani 2010).

N. Olivieri

Elaeagnus ×ebbingei Door. (Elaeagnaceae)

+ (CAS) **ITALIA (ABR):** Pescara (Pescara), “Pineta Dannunziana” (WGS84: 42.455813°N; 14.234277°E), radure, ca. 2 m, 11 August 2016, N. Olivieri (FI). – Casual alien nothospecies new for the flora of Italy (Abruzzo).

Elaeagnus ×ebbingei (*E. macrophylla* Thunb. × *E. pungens* Thunb.) is a hybrid used as an ornamental plant, especially in coastal areas. Some individuals grow on dry sandy substrates in peripheral clearings of the “Pineta Dannunziana”, near the Adriatic Sea not far from private and public gardens where the plant might be cultivated. They are partially shaded by foliage of *Pinus halepensis* Mill. subsp. *halepensis*. The presence of *E. ×ebbingei* in Italy has also been reported in Emilia-Romagna, but only as cultivated hybrid in pinewoods and dunes of the Parco Delta del Po (Lazzari et al. 2010, 2012). The species was identified according to Barnes and Whiteley (2011).

N. Olivieri

Eragrostis curvula (Schrad.) Nees (Poaceae)

– **LOM.** – Alien species to be excluded from the flora of Lombardia.

The only record of *Eragrostis curvula* for Lombardia (Mauri et al. 2012), based on a herbarium specimen stored at MSNM (duplicate in FI), is actually a misidentification with *E. pectinacea* (Michx.).

F. Verloove, G. Galasso

Eragrostis mexicana (Hornem.) Link subsp. *virescens* (J.Presl) S.D.Koch & Sánchez Vega (Poaceae)

+ (CAS) **PUG:** Casamassima (Bari) (WGS84: 40.951816°N; 16.888951°E), campo di olivi e altri fruttiferi, periodicamente arato, 230 m, 27 September 2016, F.S. D'Amico, M. Terzi (FI, BI). – Casual alien species new for the flora of Puglia.

Eragrostis mexicana subsp. *virescens* is an alien plant from South America (Argentina and Chile) whose European distribution area ranges from Portugal to Poland, and from Great Britain to Italy (Martini and Scholz 1998, Valdés and Scholz 2009). In Italy, it was recorded in northern regions and Calabria (Martini and Scholz 1998, Celesti-Grapow et al. 2009, Galasso et al. 2016a). A few individuals were found in an olive grove in a typical weed vegetation, thus confirming the occurrence of this taxon in southern Italy, where it has probably been confused with *E. pilosa* (L.) P.Beauv. subsp. *pilosa*, from which it can be distinguished for the lower isolated branch of the inflorescence (*versus* verticillate) and a pit on the ventral face of seeds (Martini and Scholz 1998).

F.S. D'Amico, M. Terzi

Euonymus japonicus Thunb. (Celastraceae)

+ (CAS) **PUG:** Otranto (Lecce), ruderì di un edificio situato in Via M. Corti (WGS84: 40.152152°N; 18.473799°E), ruderì, ca. 7 m, 21 August 2016, N. Olivieri (FI). – Casual alien species new for the flora of Puglia.

An individual of the species, reaching 3 m in height, was found growing among limestone blocks within the ruins of a building collapsed some time ago. The plant grows in a rather shady position, protected from the wind, set against an inner wall of the building. The substrate is limestone rock debris and calcarenite, on which a layer of soil has developed. The site is characterized by a humid microclimate, a few meters away from the Adriatic Sea.

N. Olivieri

Fallopia baldschuanica (Regel) Holub (Polygonaceae)

+ (NAT) **BAS:** Matera (Matera), Tre Ponti, Strada Statale 7 “Appia”, all'altezza dell'ex “Bar Ristorante delle Murge” (WGS84: 40.679654°N; 16.625529°E), stradale, con *Elymus* cfr. *repens*, 351 m, N, 8 June 2016, N. Ardenghi, P. Cauzzi, F. Guzzon (FI). – Naturalized alien species new for the flora of Basilicata.

Dense mats of this species have been observed also in Matera, about 350 m west from the locality of the reported herbarium specimen, along Strada Statale 7 (WGS84:

40.679810°N; 16.621462°E), and in Via V. Cappelluti, growing on an old wall (WGS84: 40.663492°N; 16.599205°E).

N.M.G. Ardenghi, P. Cauzzi, F. Guzzon

Ficus microcarpa L.f. (Moraceae)

+ (CAS) **PUG**: Brindisi (Brindisi), Via Duca degli Abruzzi, giardini pubblici presso il monumento al Marinaio d'Italia (WGS84: 40.645208°N; 17.946816°E), epifita su *Phoenix canariensis*, ca. 10 m, 22 August 2016, N. Olivieri (FI). – Casual alien species new for the flora of Puglia.

Ficus microcarpa is a halophytic species native to India, Sri Lanka, Nepal, China, Taiwan, Japan, Ryukyu Islands, Indochinese Peninsula, Indo-Malay Archipelago, Philippines, north-eastern Australia, New Caledonia, Solomon Islands, and part of Micronesia, widespread for ornamental purposes in Central and South America, Florida, southern California, Puerto Rico, Hawaiian Islands, Bermuda, New Zealand, and some Mediterranean countries. In many of these countries it is naturalized as lithophyte and hemi-epiphyte, often as invasive. In the Mediterranean region, it is considered invasive in Israel (Dufour-Dror 2013). In Brindisi, some young individuals have developed on the top of the trunk of a medium sized *Phoenix canariensis* H.Wilddpret, between the rachis residues of cut leaves. They originated from seeds produced by a tree growing in a neighbouring garden. The syconia of this species are eaten by birds and the plant spreads by zochory. In Italy, *F. microcarpa* has, until now, been reported in Sicilia (Schicchi 1999, Domina and Mazzola 2002) and Sardegna (Lazzeri et al. 2015) as naturalized and casual alien species, respectively.

N. Olivieri

Hedera algeriensis Hibberd (Araliaceae)

+ (CAS) **MAR**: Grottammare (Ascoli Piceno), Via Beata L. Sernardi (WGS84: 42.996095°N; 13.866046°E), crepa nell'asfalto tra muro e strada, 91 m, 30 May 2016, N. Ardenghi, P. Cauzzi, F. Guzzon (FI). – Casual alien species new for the flora of Marche.

N.M.G. Ardenghi, P. Cauzzi, F. Guzzon

Hedera canariensis Willd. (Araliaceae)

+ (CAS) **PUG**: Bisceglie (Barletta-Andria-Trani), loc. Matinella, SP85 (WGS84: 41.186373°N; 16.472764°E), incolto con *Lolium perenne* e *Vitis ×koberi*, 120 m,

2 June 2016, N. Ardenghi, P. Cauzzi, F. Guzzon (FI). – Casual alien species new for the flora of Puglia.

N.M.G. Ardenghi, P. Cauzzi, F. Guzzon

Lantana camara L. subsp. *aculeata* (L.) R.W.Sanders (Verbenaceae)

+ (NAT) **SIC**: Palermo (Palermo), Inserra (WGS84: 38.151857°N; 13.305263°E), pascolo, ca. 150 m, 9 November 2001, P. Mazzola, G. Domina (PAL); Vittoria (Ragusa), Scoglitti, inculti a E di Via Cocalo (WGS84: 36.889971°N; 14.436246°E), incerto con *Mirabilis jalapa*, *Saccharum biflorum* e *Solanum linnaeanum*, 31 m, no exp., 10 June 2014, E. Banfi (FI, MSNM); Santa Flavia (Palermo), Capo Zafferano, sulle pareti delle rupi sopra la strada (Stradella Vicinale Torre Zafferano) che porta al faro (WGS84: 38.110155°N; 13.538511°E), rupi, ca. 30 m, NE, 16 June 2016, G. Domina (PAL). – Naturalized alien subspecies new for the flora of Sicilia.

This taxon has already been reported in Abruzzo (Galasso et al. 2016a) and Molise (Galasso et al. 2016b). The previous report for Sicilia by Domina and Mazzola (2002) of *Lantana camara* has to be referred to this subspecies. According to Sanders (2012), it is easily distinguished due to the stout, recurved, often abundant prickles that cover stems. The plant appears as a robust shrub sometimes up to 3 m in height; corollas, basically yellow, aging red-orange, are typically infused with purple, sometimes pink at opening, aging to deep reddish-purple. Cultivated worldwide in the tropics and subtropics (horticultural origin) and largely escaped, especially in Africa and Australia (Sanders 2012); within the genus *Lantana*, this taxon seems to show a great autonomy in temperate climates.

E. Banfi, G. Galasso, G. Domina

Lantana depressa Small (Verbenaceae)

+ (CAS) **ITALIA (SIC)**: Vittoria (Ragusa), Scoglitti, prolungamento sterrato di Via Pescara verso la spiaggia (WGS84: 36.892863°N; 14.427918°E), residui di duna, 9 m, no exp., 10 June 2014, E. Banfi (FI, MSNM). – Casual alien species new for the flora of Italy (Sicilia).

According to Sanders (2012), the collected plants have to be attributed to the type variety of the species (var. *depressa*) because of its low-mounded shape, the height not reaching 1 m, the lack of a main stem, stems numerous, condensed, prominent, prostrate or decumbent and leaf blade not longer than 3 cm, strigilloso-strigose on the adaxial surface. It comes from peninsular Florida (Miami Ridge), where it typically grows in limestone pinelands; extensively cultivated and escaped in tropics and subtropics worldwide (Sanders 2012).

E. Banfi, G. Galasso, G. Domina

Ligustrum sinense Lour. (Oleaceae)

+ (CAS) **MOL**: Termoli (Campobasso), versante settentrionale del Vallone del Riovivo (WGS84: 41.996544°N; 14.994824°E), su lettiera di leccio, ca. 25 m, 3 September 2016, N. Olivieri (FI). – Casual alien species new for the flora of Molise.

Some young individuals grow on sandy soil, rich in litter, in the urban park of Termoli, under some *Quercus ilex* L. subsp. *ilex* trees and together with young plants of *Rhamnus alaternus* L. subsp. *alaternus* and *Q. ilex*. They have originated from seeds produced by some plants cultivated in the park.

N. Olivieri

Ludwigia peploides (Kunth) P.H.Raven subsp. *montevidensis* (Spreng.) P.H.Raven (Onagraceae)

+ (INV) **TOS**: Carmignano (Prato), fraz. Comeana, sponda del Torrente Ombrone Pistoiese (WGS84: 43.790174°N; 11.058680°E), sponda, popolazione di alcuni metri quadrati, distribuita sia in destra che in sinistra idrografica, 32 m, 26 August 2016, J. Vannini, D. Dinelli, det. J. Vannini, D. Dinelli, V. Bigagli (FI). – Invasive alien subspecies new for the flora of Toscana.

Ludwigia peploides subsp. *montevidensis* is an aquatic subspecies of South American origin, established in many European countries. It was introduced in Italy in the 20th century as ornamental plant for aquaria (Banfi and Galasso 2010). It quickly spread in many regions of northern Italy, as well as in Lazio (Azzella and Iberite 2010). It is a harmful invasive plant due to its rapid vegetative growth and high spread potential. The plant is subject to control and eradication projects in many European and South American countries. It was recently included in the list of Invasive Alien Species of Union Concern (Commission Implementing Regulation EU 2016/1141). The plant was identified according to Galasso (2007) and it was also observed in other locations along the Torrente Ombrone (il Castellare –Pistoia municipality, Pistoia–, Caserana and Ferruccia –Quarrata municipality, Pistoia–) and along the Arno River (Camaioni –Montelupo Fiorentino municipality, Firenze–). During the summer of 2016, rapid expansion of the taxon and a considerable increase of its coverage was observed.

J. Vannini, D. Dinelli, V. Bigagli, G. Ferretti

Morus indica L. (Moraceae)

+ (CAS) **ABR**: Francavilla al Mare (Chieti), recinzione in cemento posta tra un parcheggio e la linea ferroviaria, presso Via C. de Titta (WGS84: 42.421338°N; 14.287327°E), bordo di recinzione, ca. 3 m, 28 October 2016, N. Olivieri (FI). – Casual alien species new for the flora of Abruzzo.

A young specimen, about 2 m tall, grows within the town, on sandy soil near the Adriatic coast. The species is present with some adult trees grown as ornamental in neighboring private gardens. *Morus indica* is an East Asian species, originally distributed in China, Japan, Korea, Bhutan, India, Myanmar and Nepal (Zhou and Gilbert 2003), which has recently spread in Mediterranean countries as ornamental and shade-tree species, especially in coastal areas, for its resistance to salty winds. In Italy, *M. indica* had been found, so far, only in Lazio (Galasso et al. 2016b).

N. Olivieri

+ (CAS) **PUG**: Gallipoli (Lecce), lungo Via Messina, in un'area parzialmente ombreggiata (WGS84: 40.060313°N; 17.998421°E), bordo di marciapiede, ca. 27 m, 19 August 2016, N. Olivieri (FI). – Casual alien species new for the flora of Puglia.

A young individual was found growing along the sidewalk in an area, partially shaded by the foliage of *Grevillea robusta* A.Cunn. ex R.Br., near a public garden where there is an arboreal individual of the species. The place is located in a suburban area, not far from the Ionian Sea.

N. Olivieri

Oenothera laciniata Hill. (Onagraceae)

+ (CAS) **LOM**: Vigevano (Pavia), Bosco Ronchi (WGS84: 45.285492°N; 8.937638°E), in a dry grassland, 75 m, 7 June 2016, G. Gheza, det. S. Assini (FI). – Casual alien species new for the flora of Lombardia.

Oenothera laciniata, which is native to North America, is known in Italy for Piemonte (Bouvet et al. 2005), Toscana (Foggi et al. 2005, Pierini and Peruzzi 2014) and Campania (Ricciardi et al. 1988). In the locality reported here, the species was recorded in a dry grassland of the *Thero-Airion* Tx. ex Oberd. 1957 in the valley of the Ticino River.

G. Gheza, S. Assini

Opuntia polyacantha Haw. (Cactaceae)

+ (CAS) **ITALIA (TAA)**: Merano (Bolzano), Passeggiata Tappeiner (WGS84: 46.682944 N; 11.154278°E), prateria arida (*Festucetalia valesiacae*) su gneiss, 390 m, 2 January 2016, T. Wilhalm (BOZ); *ibidem*, 30 June 2016, T. Wilhalm, A. Guiggi, M. Fink (FI, BOZ, HMGBH). – Casual alien species new for the flora of Italy (Trentino-Alto Adige).

This species, of North American origin, is characterized by a prostrate habit and brown-yellowish fruit, dry when ripe (Benson 1982). Rarely cultivated, it has a re-

markable hardiness for low temperatures and showy blooms. The group of individuals observed in an area of ca. 1–2 m², excluding the ornithochory for the characteristics of the fruit, is probably of anthropic origin due to the ornamental value of the species. The plant produces flowers and fruits in this habitat.

A. Guiggi, T. Wilhalm

Oxalis latifolia Kunth (Oxalidaceae)

+ (CAS) **PUG**: Foggia (Foggia), Villa Comunale – Parco Karol Wojtyla (WGS84: 41.462011°N; 15.560057°E), vegetazione erbacea al di sotto di esemplari di *Pinus halepensis* ed *Eucalyptus camaldulensis*, ca. 64 m, 18 August 2016, N. Olivieri (FI). – Casual alien species new for the flora of Puglia.

The species occurs in several areas of the park, mostly partially shaded by trees and in flowerbeds. Specimens have settled in groups on calcareous, alluvial, vertisol, in a dry area of herbaceous vegetation subjected to partial desiccation in the summer.

N. Olivieri

Parkinsonia aculeata L. (Fabaceae)

+ (CAS) **LIG**: Genova (Genova), Quinto al Mare, Via A. Gianelli (44.383852°N; 9.022160°E), fra la strada asfaltata e il marciapiede, 16 m, 22 September 2016, S. Peccenini (FI). – Casual alien species new for the flora of Liguria.

Parkinsonia aculeata, native to the northern and central American deserts, is reported in Italy as naturalized in Sicilia and Puglia, casual in Lazio, Calabria and Sardegna (Celesti-Grapow et al. 2009, Celesti-Grapow et al. 2013, Buono et al. 2017).

S. Peccenini

Paspalum dilatatum Poir. (Poaceae)

+ (NAT) **PIE**: Ronco Biellese (Biella), fraz. San Carlo-Caucino, lungo i margini di Via Camillo Benso Conte di Cavour e nei prati immediatamente a ridosso della strada (WGS84: 45.5835°N; 8.0852°E), margine stradale e prati, 540 m, 25 August 2015, G. Peraldo, E. Bonivento, conf. M. Lonati, A. Selvaggi, F. Verloove (FI). – Naturalized alien species new for the flora of Piemonte.

The genus *Paspalum* L. includes nearly 350 species distributed in tropical and subtropical regions, among which ten species are naturalized in Europe (Banfi and Galasso 2015, Verloove et al. 2016, Galasso et al. 2016a). In Italy, *P. dilatatum* was first ob-

served in Liguria, where it probably started spreading after 1909 from the neighbouring Nice in France (Ariello 1952). Until recently, the species was known from most of the Italian administrative regions (Conti et al. 2005), but not yet from Piemonte. The vector of introduction in the San Carlo-Caucino locality is not clear. However, the species was probably introduced as a weed seed contained in chicken feed, as confirmed by the first plants being observed within a small family-run henhouse (year 2014). The species has been slowly spreading and now it occupies a scattered area close to the road, ranging between 520 to 550 m a.s.l.

G. Peraldo, E. Bonivento, M. Lonati, F. Verloove, A. Selvaggi

Paulownia tomentosa (Thunb.) Steud. (Paulowniaceae)

+ (CAS) **PUG:** Gallipoli (Lecce), bordo di giardino pubblico presso Via Pavia (WGS84: 40.059127°N; 17.997769°E), margine, ca. 27 m, 19 August 2016, N. Olivieri (FI). – Casual alien species new for the flora of Puglia.

The species is present with few, young individuals, some higher than 2 m, growing on the edge of a public garden in a dry and fairly sunny area, on residual red soil of calcareous origin. The specimens probably originated from seeds produced by a tree cultivated in the neighboring garden.

N. Olivieri

Platycladus orientalis (L.) Franco (Cupressaceae)

+ (CAS) **PUG:** Castrignano del Capo (Lecce), loc. Santa Maria di Leuca, parete rocciosa lungo la Strada Provinciale 358 “Delle Terme Salentine” nei pressi dello svincolo per Via Foresta Forte (WGS84: 39.798055°N; 18.368838°E), parete rocciosa, ca. 60 m, S, 21 August 2016, N. Olivieri (FI). – Casual alien species new for the flora of Puglia.

Some young individuals of the species have developed towards the top of the sub-vertical limestone rockface along the trench roadway, with *Thymbra capitata* (L.) Cav., *Dittrichia viscosa* (L.) Greuter subsp. *viscosa* and young individuals of *Pistacia lentiscus* L. They originated from seeds produced by some plants cultivated for ornamental purposes at the edges of a neighbouring private garden.

N. Olivieri

Pleuropterus multiflorus (Thunb.) Nakai (Polygonaceae)

≡ *Fallopia multiflora* (Thunb.) Haraldson ≡ *Reynoutria multiflora* (Thunb.) Moldenke

+ (CAS) **ABR:** Teramo (Teramo), lungo l'alveo del Torrente Vezzola (WGS84: 42.664161°N; 13.699792°E), vegetazione ripariale, ca. 240 m, 16 October 2016, *N. Olivieri* (FI). – Casual alien species new for the flora of Abruzzo.

Some individuals of the species grow along a path near the Vezzola Stream riverbed. They climb up to 3 m on *Robinia pseudoacacia* L. and *Prunus cerasifera* Ehrh. Below they are intertwined with branches of *Rubus ulmifolius* Schott. *Pleuropteris multiflorus* is a rhizomatous perennial climbing species, native to central and southern China (Li et al. 2003), introduced in Europe probably in the late 19th century as ornamental and recently spreading as alien in several administrative regions of northern Italy: Lombardia, Veneto, Trentino-Alto Adige, Piemonte (Galasso et al. 2006, Galasso and Ceffali 2008, Celesti-Grapow et al. 2009, Soldano and Galasso 2011), and Emilia-Romagna (<http://www.actaplantarum.org/floraitaliae/viewtopic.php?f=40&t=69727>, <http://www.actaplantarum.org/floraitaliae/viewtopic.php?f=40&t=67829>).

N. Olivieri

Rumex cristatus DC. (Polygonaceae)

+ (INV) **BAS:** Matera (Matera), Tre Ponti, Strada Provinciale Matera–Gioia del Colle (WGS84: 40.679146°N; 16.627682°E), margine stradale, con *Avena sterilis* subsp. *ludoviciana*, *Dasyperym villosum*, *Carduus pycnocephalus*, *Ferula communis*, 342 m, 8 June 2016, *N. Ardenghi, P. Cauzzi, F. Guzzon* (Herb. *N. Ardenghi*); *ibidem*, Masseria di Pietrapenta, cava abbandonata (WGS84: 40.632286°N; 16.543702°E), terreno rudereale, con *Beta maritima*, *Dittrichia viscosa*, *Foeniculum vulgare*, 149 m, 9 June 2016, *N. Ardenghi, P. Cauzzi* (FI); *ibidem*, C.da Chiancalata, a lato della stradina per lo Studio legale Cifarelli (WGS84: 40.648249°N; 16.609604°E), fosso a lato della strada, con *Avena sterilis* e *Sorghum halepense*, 306 m, 10 June 2016, *N. Ardenghi, P. Cauzzi, F. Guzzon* (FI). – Invasive cryptogenic species new for the flora of Basilicata.

The choice of the invasive status is justified by the population near locality Tre Ponti in Matera, consisting of about 1,000 individuals distributed along the banks of the Fiumicello Stream over a distance of 1.15 km, from Tre Ponti eastwards to the point where the streamflow changes its direction northwards (WGS84: 40.679487°N; 16.641782°E).

N.M.G. Ardenghi, P. Cauzzi, F. Guzzon

Salvia abrotanoides (Kar.) Sytsma × *Salvia yangii* B.T.Drew (Lamiaceae)

+ (CAS) **ITALIA (LOM):** Milano (Milano), binari a lato di Via Molinetto di Lorenteggio (comune di Corsico), angolo Via F. Gonin (WGS84: 45.441001°N; 9.117402°E), binari del tram, 118 m, no exp., 29 September 2013, *G. Galasso* (FI, MSNM). – Casual alien hybrid new for the flora of Italy (Lombardia).

+ (CAS) **TAA:** Pergine Valsugana (Trento), Pergine, sull'argine destro del Torrente Fersina poco a valle del ponte per Brazzaniga (CFCE: 9933/1) (WGS84: 46.071290°N; 11.236011°E), argine-margine della strada, tre cespi in un punto dove certamente non è stata piantata, presenza casuale, 488 m, 30 September 2014, *A. Bertolli, F. Prosser, G. Tomasi* (FI, ROV-67688). – Casual alien hybrid new for the flora of Trentino-Alto Adige.

+ (CAS) **TOS:** Siena (Siena), Strada di Marciano, su un muro esterno del Park Hotel Villa Gori Golf Club (WGS84: 43.331675°N; 11.305386°E), muro, 357 m, SE, 22 July 2016, *G. Bonari* (FI). – Casual alien hybrid new for the flora of Toscana.

Salvia subg. *Perovskia* (Kar.) J.B.Walker, B.T.Drew & J.G.González (Drew et al. 2017) includes about 8 species widely distributed over arid regions of Asia (Krüssmann et al. 1986, Hedge 1990, Li and Hedge 1994, Grant 2000, Hedge 2011). We considered several sources to identify our plants. Several cultivars are selected by gardeners (Grant 2007) thereby complicating nomenclature and identification. At first glance, we were inclined to attribute the taxon to *S. yangii* (\equiv *Perovskia atriplicifolia* Benth.), but leaves were not “simple, margins crenate, serrate or subentire” as reported by Hedge (2011, see also Rechinger 1982). In fact, several varieties can be identified based on leaf shape and indumentum characters, but a comprehensive review is lacking (Hedge and Lamond 1968). Thus, “leaves bipinnatisect” guided us towards *S. abrotanoides* (\equiv *P. abrotanoides* Kar.), also considering the figures (plates 369–372, 592) reported by Rechinger et al. (1982). However, this taxon did not perfectly fit our specimens either. Rechinger (1982) reported a hybrid (pl. 373 in Rechinger et al. 1982), which is the plant cultivated in North America according to Darke and Tucker (1989). Our plants seemed to correspond to “*Perovskia* \times ‘Hybrida’ (= *P. abrotanoides* \times *atriplicifolia*?)”, based on the figure provided by Krüssmann et al. (1986), a plant cultivated by Hillier (England) since 1937 and distributed from the Geisenheim Research Institute since 1955 as *P. ‘Superba’*. Because our specimens surely derived from seeds dispersed from cultivated flowerbeds in the cities, “*P. ‘Hybrida’*” should be the best name to apply, but “it is not clear whether the majority of cultivars are variants of *P. atriplicifolia* or hybrids between *P. abrotanoides* and *P. atriplicifolia*” (Grant 2007). Considering that they differ from both the genuine putative parental species, we prefer to use the name *S. abrotanoides* \times *S. yangii*, a hybrid apparently without nothospecific epithet because the only available one (in *Perovskia*) is *P. \times intermedia* Lazkov (*P. abrotanoides* \times *P. angustifolia* Kudr.; Sennikov et al. 2011).

G. Bonari, G. Galasso, F. Prosser

Senecio inaequidens DC. (Asteraceae)

+ (NAT) **PUG:** San Giovanni Rotondo (Foggia), periferia S del paese (WGS84: 41.699155°N; 15.720507°E), margine stradale, 550 m, 25 October 2016, *R.P. Wagensommer* (Herb. *R.P. Wagensommer*); *ibidem*, periferia SSW del paese (WGS84:

41.699451°N; 15.711909°E), margine stradale e su materiale di riporto (ghiaia), 560 m, 27 October 2016, R.P. Wagensommer (FI, Herb. R.P. Wagensommer); Lesina (Foggia), alla stazione ferroviaria (WGS84: 41.854374°N; 15.296612°E), margine stradale e del parcheggio asfaltato, 40 m, 27 October 2016, R.P. Wagensommer (Herb. R.P. Wagensommer). – Naturalized alien species new for the flora of Puglia.

This invasive species occurs in all Italian administrative regions. To date, it was not recorded only in Puglia (Conti et al. 2005, Celesti-Grapow et al. 2009). We found it in two different sites on the Gargano Promontory, Lesina (about 30 mature individuals) and San Giovanni Rotondo (about 50 mature individuals).

R.P. Wagensommer, E.V. Perrino, G. Russo

Setaria parviflora (Poir.) Kerguélen (Poaceae)

+ (NAT) **CAL:** Scalea (Cosenza), Via Ruggiero di Lauria (WGS84: 39.815817°N; 15.787228°E), fessure della pavimentazione, 6 m, 20 August 2014, A. Stinca (PORUN). – Status change from casual to naturalized alien for the flora of Calabria.

This species is recorded from Lombardia, Liguria, Toscana, Marche, Lazio, Campania, Puglia, Calabria, Sicilia, and Sardegna (Celesti-Grapow et al. 2009, Cecchi and Arrigoni 2013, Stinca et al. 2013, Gubellini et al. 2014, Stinca et al. 2016). In Calabria, *Setaria parviflora* is reported as a casual alien (Bernardo et al. 2009) where it was known only for the valley of the Crati River (Banfi and Passalacqua 2011). At Scalea, it exhibits a notable vegetative and sexual propagation capacity; it was also observed in August 2016.

A. Stinca

Syagrus romanzoffiana (Cham.) Glassman (Arecaceae)

+ (CAS) **ITALIA (PUG):** Brindisi (Brindisi), Via Duca degli Abruzzi, giardini pubblici presso il monumento al Marinaio d'Italia (WGS84: 40.644977°N; 17.946627°E), tapeto erboso umido spesso irrigato, ca. 10 m, S, 22 August 2016, N. Olivieri (FI). – Casual alien species new for the flora of Italy (Puglia).

Some very young specimens, identified according to Cullen et al. (2011) and Squire (2007), have grown close to adult individuals of the species in a wet meadow frequently watered and located near the Adriatic Sea. In Brindisi *Syagrus romanzoffiana* is very popular as an ornamental plant in gardens and avenues. Fruits are regularly produced and accumulate on the ground below the trees. The species is native to South America (Brazil, part of Argentina, Paraguay, Uruguay and Bolivia). For its ornamental value, it is widespread in many tropical and subtropical areas and, more recently, also in Mediterranean countries. It is naturalized in Florida, Mauritius and eastern

Australia (Queensland and New South Wales), where it is considered an invasive alien (Randall 2001).

N. Olivieri

Tradescantia fluminensis Vell. (Commelinaceae)

+ (CAS) **MOL**: Termoli (Campobasso), versante collinare S del Vallone del Riovivo (WGS84: 41.993833°N; 14.996083°E), margine di sentiero e canneto di *Arundo donax*, ca. 27 m, 3 September 2016, N. Olivieri (FI). – Casual alien species new for the flora of Molise.

The species grows near the Adriatic coast, in the urban park of Termoli, along a path edge and inside a cane thicket of *Arundo donax* L., along with *Rubus ulmifolius* Schott, *Hedera helix* L. and *Parietaria judaica* L. Plants grow in penumbra, on sand-stone soil covered by nitrophilous vegetation typical of disturbed shaded areas.

N. Olivieri

Trifolium alexandrinum L. (Fabaceae)

+ (CAS) **BAS**: Matera (Matera), Bosco di Lucignano, ca. 185 m a SE dalla Cisterna di San Francesco (WGS84: 40.606911°N; 16.703098°E), campo di grano duro, con *Avena sterilis* subsp. *ludoviciana*, *Glebionis segetum*, *Anchusa azurea*, *Phalaris brachystachys*, un esemplare, 363 m, 9 June 2016, N. Ardenghi, P. Cauzzi (FI). – Casual cryptogenic species new for the flora of Basilicata.

A single individual was found in the middle of a durum wheat field.

N.M.G. Ardenghi, P. Cauzzi, F. Guzzon

Vicia lens (L.) Coss. & Germ. subsp. *orientalis* (Boiss.) Galasso, Banfi, Bartolucci & J.-M.Tison, comb. nov. (Fabaceae)
urn:lsid:ipni.org:names:60474540-2

≡ *Ervum orientale* Boiss., Diagn. Pl. Orient., ser. 1 9: 115(–116). 1849 [I-II.1849]
 ≡ *Lens orientalis* (Boiss.) Schmalh., Fl. Sredn. Yuzhn. Rossii 1: 297. 1895 ≡ *Vicia orientalis* (Boiss.) Bég. & Diratz., Contr. Fl. Armenia: 61. 1912 [XI.1912] (n.v.)
 ≡ *Lens culinaris* Medik. subsp. *orientalis* (Boiss.) Ponert, Feddes Repert. 83(9–10) (1972): 634. 1973 [25.IV.1973].

According to the molecular phylogenetic research published by Schaefer et al. (2012), the genus *Lens* Mill. is nested within *Vicia* L. For the type species of *Lens*

(*Lens culinaris* Medik.), the binomial *Vicia lens* (L.) Coss. & Germ. was restored by the above cited authors. Since the subspecific rank is considered suitable for representing taxonomic relationships between a domesticated crop and its wild relative, a new combination is proposed here for the wild relative of *Vicia lens*. It is distinct from the crop for a smaller size of the plant, allogamy, ready opening of the mature pod and seed dormancy (Ladizinski 1993, Zohari et al. 2012).

G. Galasso, E. Banfi, F. Bartolucci, J.-M. Tison

Yucca gloriosa L. (Asparagaceae)

+ (INV) **TOS.** – Status change from naturalized to invasive alien for the flora of Toscana.

Yucca gloriosa, native to North America, is currently recognized as naturalized in Toscana (Ciccarelli et al. 2015). During field surveys conducted along the coastal part of the Migliarino-San Rossore-Massaciuccoli Regional Park, we noted a widespread diffusion of the species. Its high frequency along the Tuscan coast can be also deduced from several floristic records (Peruzzi and Bedini 2015 onwards, Roma-Marzio et al. 2016 and literature cited therein). Based on our field observations, the species shows a high clonal propagation capacity, determining modifications in vegetation and ecosystem dynamics. In addition, the *ad hoc* LIFE project DUNETOSCA (<http://ec.europa.eu/environment/life/project/Projects/>), conducted in 2010–2013, failed to eradicate the species. Based on these considerations, we regard the status of invasive alien to be most appropriate for *Y. gloriosa* in Toscana.

M. D'Antraccoli, F. Roma-Marzio

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Contribution to the floristic knowledge of the Maddalena Mountains (Basilicata and Campania, southern Italy)

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Abstract

The inventory of the taxa collected during the annual field trip of the working group for Floristics, Systematics and Evolution of the Italian Botanical Society is reported. It was held in 2013 along the Maddalena Mountains, a mountain ridge of the southern Apennines located between the Basilicata and Campania administrative regions (southern Italy), considered as being poorly characterized in terms of vascular flora. A total of 701 units belonging to 74 plant families were recorded including two varieties and four hybrids.

Thirty-five taxa resulted endemic to Italy and only 11 alien species were detected, while 36 taxa are new or confirmed for the regional floras of Basilicata and/or Campania. In particular, 12 taxa are new for Basilicata, while four are confirmed. Regarding Campania, 14 taxa resulted new for the regional flora and five were confirmed.

Keywords

New floristic records, regional flora, southern Apennines, vascular flora

Introduction

In recent years, the working group for Floristics, Systematics and Evolution of the Italian Botanical Society has been very active in increasing the knowledge about the vascular flora of poorly known areas. Specifically, several contributions have been published regarding southern Italy (e.g. Bernardo et al. 2012, Wagensommer et al. 2014, Domina et al. 2015), as the result of the annual field trip organized by the group. Two of these contributions were focused on Basilicata (Conti et al. 2006, 2007b) and one on Campania region (Santangelo et al. 2010).

The selection of the areas to be investigated has been mostly addressed to fill the gaps pointed out by Scoppola and Blasi (2005) or by others regional or national projects, as the mapping of Important Plant Areas (Blasi et al. 2011).

In this paper, we present the results of the field trip held in 2013 in the southern Apennines and organized by the botanists of the University of Basilicata (L. Rosati, S. Fascetti and V.A. Romano), aimed at increasing our floristic knowledge of the western border between the Italian administrative regions of Basilicata and Campania.

Study area

The investigated area includes the central part of the Maddalena Mountains and some neighbouring biotopes of particular interest for vascular plants (Suppl. material 1: 1).

The Maddalena Mountains are a carbonatic ridge, aligned from NNW to SSE and extending for 40 km. They are located between the intramountain basins of the Val d'Agri (Basilicata) to the east and the Vallo di Diano (Campania) to the west. The altitude ranges from 300 m a.s.l. at the bottom of Melandro Valley, to 1503 m a.s.l. at the top of Serra Longa.

This sector of the southern Apennines is characterized by a remarkable geological complexity, mainly due to the effects of a translational tectonic that placed the formations of the Mesozoic carbonatic platform on the silico-clastic Lagonegrese Units. The Holocene detritus represents the connection with the recent alluvial deposits of the main valleys due to tectonic morpho-structures shaped like a “graben” (Grimaldi and Summa 2005).

The morpho-structure of the Maddalena Mountains is less affected by karst phenomena than other massifs of southern Italy; however, karstification is well developed in those areas where Cretaceous limestones prevail on Triassic dolomites (Celico 1979). Several tec-

tonic-karst basins (Mandrano, Mandranello, Magorno etc.) that are periodically flooded during the winter-spring season and are dotted with numerous sinkholes can be observed; they correspond to graben or contacts between lithotypes with different permeabilities.

Rainfall in the area is concentrated in the autumn-winter period, with a maximum in November-December and a minimum in summer (July-August); a summer drought of two to three months also occurs (Suppl. material 1: 2). Annual average temperature ranges from 12.5 to 14.7 °C, with the hottest months in summer (July-August) and the coldest in winter (January-February).

According to the classification proposed by Rivas-Martinez et al. (2011), a dominant Mediterranean pluviseasonal oceanic-semicontinental macrobioclimate can be recognized in the hilly and submontane belt (ranging from the lower humid mesomediterranean to humid supramediterranean phytoclimatic belt). However, local factors (increasing altitude, northern slopes) influence the shift towards the oceanic humid supratemperate belt.

The Maddalena Mountains are partially included within the Appennino Lucano National Park and within two Natura 2000 sites: "Monti della Maddalena" (code IT8050034) and "Faggeta di Moliterno" (code IT9210110). Nevertheless, this territory has never been the object of specific botanical contributions, except for the biotope "Faggeta di Moliterno" located in the southern part of the ridge (Fascetti et al. 2013). Other information concerning the vascular flora of this sector is available for the adjacent areas of the Lucanian Apennines (e.g. Gavioli 1948) or for the Cilento, Vallo di Diano and Alburni National Park (e.g. Moggi 2002, Rosati et al. 2010, 2012 and references therein).

Materials and methods

To maximize vascular flora sampling, 12 sites were selected as representative of the local diversity in terms of climate, litho-morphology, and land use (Suppl. material 1: 3). They were intensively sampled during the period 5–8 June, 2013 by 24 participants (Suppl. material 1: 4). The floristic list followed the same methodology as in previous contributions (e.g. Conti et al. 2006, Peccenini et al. 2010, Peruzzi et al. 2011).

The work was coordinated and the floristic list drawn up by the organizers with the contribution of all participants to the excursion. A revision of the samples collected during the field work was carried out at the University of Roma Tre (27–28 February, 2014), followed by specific studies and comparisons of unidentified taxa. Some critical samples were sent to specialists for determination: *Viola* (A. Scoppola, Viterbo), *Orobanche* (G. Domina, Palermo), ferns (D. Marchetti, Massa).

Nomenclature and taxa delimitation followed the updated version of the Checklist of Italian Flora (Bartolucci et al. 2016, Galasso et al. 2016), which is currently in the final stage of drafting, except for varieties (not considered in the Italian Checklist) and some hybrids (for further details see the notes in Suppl. material 1: 6). For the Orchidaceae, we followed Hertel and Presser (2015) and GIROS (2016), whereas for the genus *Rosa* we referred to Klastersky (1968).

For each unit at least one herbarium specimen was prepared and preserved in public or private herbaria listed in Suppl. material 1: 5.

The floristic list (Suppl. material 1: 6) was sorted in a linear sequence of families according to PPG I (2016), Christenhusz et al. (2011) and APG IV (2016) and taxa were ordered alphabetically. Synonyms are indicated in square brackets only in the case of changes that have occurred from the last version of the Italian Checklist of vascular flora (Conti et al. 2005, 2007a).

For each unit, we reported locations of collection, using the abbreviations given in Suppl. material 1: 3, and the prevailing environments of growth. The herbaria where samples are stored (acronyms for official herbaria according to Thiers 2016) are reported in brackets. The floristic novelties for the regional flora are marked with asterisks in Supplementary data (* = confirmed taxon, ** = taxon new for the regional flora, BAS = Basilicata; CAM = Campania). The letters “E” and “A” preceding the scientific names of the taxa indicate endemic and alien taxa, respectively.

Results

In total, more than 2600 samples of vascular plants were collected, belonging to 701 taxa and 74 families (see the complete floristic list in the Suppl. material 1: 1), including two varieties (*Ophrys apifera* Huds var. *bicolor* (Nägeli) E.Nelson and *Salvia officinalis* L. var. *angustifolia* Ten.) and four hybrids (*Acer × coriaceum* Bosc ex Tausch., *Anacamptis morio* (L.) R.M.Bateman, Pridgeon & M.W.Chase × *A. laxiflora* (Lam.) R.M.Bateman, Pridgeon & M.W.Chase, *Crataegus × media* Bechst. nothovar. *sicula* (K.Koch) K.I.Chr., and *Thymus longicaulis* C.Presl × *Thymus striatus* Vahl).

Thirty-five *taxa* are considered endemic to Italy (Peruzzi et al. 2014) and, amongst these, the following are restricted to southern Italy:

- *Achillea rupestris* Huter, Porta & Rigo subsp. *calcarea* (Huter, Porta & Rigo) Greuter
- *Alyssum diffusum* Ten. subsp. *calabicum* Španiel, Marhold, N.G.Passal. & Lihová
- *Epipactis collaris* S.Hertel
- *Epipactis lucana* H.Presser, S.Hertel & V.A.Romano
- *Knautia lucana* Lacaita & Szabó
- *Koeleria lucana* Brullo, Giusso & Miniss.
- *Koeleria splendens* C.Presl
- *Lathyrus jordanii* (Ten.) Ces., Pass. & Gibelli
- *Scorzonera villosa* Scop. subsp. *columnae* (Guss.) Nyman
- *Viola aethnensis* (DC.) Strobl subsp. *splendida* (W.Becker) Merxm. & Lippert

Only 11 taxa were alien (*Agrostemma githago* L., *Centaurea cyanus*, L., *Erigeron sumatrensis* Retz., *Gladiolus italicus* Mill., *Isatis tinctoria* L. subsp. *tinctoria*, *Malus pumila* Mill., *Papaver dubium* L. subsp. *dubium*, *Petroselinum crispum* (Mill.) Fuss, *Prunus dulcis* (Mill.) D.A.Webb, *Senecio inaequidens* DC., *Veronica persica* Poir.).

Thirty-six taxa have to be considered as floristic novelties because either new or confirmed for the regional flora of Basilicata and/or Campania.

In particular, 12 resulted new for the flora of Basilicata:

- *Asparagus tenuifolius* Lam.
- *Blackstonia acuminata* (W.D.J.Koch & Ziz) Domin subsp. *aestiva* (K.Malý) Zeltner
- *Carex humilis* Leyss.
- *Colchicum lusitanum* Brot.
- *Iberis umbellata* L.
- *Jasione montana* L.
- *Koeleria splendens* C.Presl
- *Lupinus albus* L. subsp. *graecus* (Boiss. & Spruner) Franco & P.Silva
- *Rosa inodora* Fr.
- *Rosa mollis* Sm.
- *Valerianella microcarpa* Loisel.
- *Viola eugeniae* Parl. subsp. *eugeniae*

As regards the following units, the subspecific rank for Basilicata was specified:

- *Rhinanthus alectorolophus* (Scop.) Pollich subsp. *alectorolophus*
- *Silene italica* (L.) Pers. subsp. *sicula* (Ucria) Jeanm.

Four taxa were confirmed for Basilicata:

- *Cardamine amporitana* Sennen & Pau
- *Thalictrum simplex* L. subsp. *simplex*
- *Thymus moesiacus* Velen.
- *Scabiosa columbaria* L. subsp. *portae* (Huter) Hayek

Fourteen taxa resulted new for the regional flora of Campania:

- *Bromus hordeaceus* L. subsp. *pseudothominei* (P.M.Sm.) H.Scholz
- *Carex tomentosa* L.
- *Hordeum geniculatum* All.
- *Juncus tenageia* L.f. subsp. *tenageia*
- *Knautia lucana* Lacaita & Szabó
- *Koeleria lucana* Brullo, Giusso & Miniss.
- *Pilosella piloselloides* (Vill.) Soják subsp. *praealta* (Gochnat) S.Bräut. & Greuter
- *Ranunculus peltatus* Schrank subsp. *peltatus*
- *Rosa mollis* Sm.
- *Rubus incanescens* L.
- *Sanguisorba officinalis* L.
- *Scabiosa columbaria* L. subsp. *portae* (Huter) Hayek
- *Silene italica* (L.) Pers. subsp. *sicula* (Ucria) Jeanm.
- *Trifolium phleoides* Willd.

Finally, five taxa were confirmed for Campania:

- *Alisma lanceolatum* With.
- *Alopecurus aequalis* Sobol.
- *Myosotis nemorosa* Besser
- *Sabulina glaucina* (Dvořáková) Dillenb. & Kadereit
- *Vicia serratifolia* Jacq.

Conclusions

The high number of taxa surveyed in a few days and in a limited number of sampling localities undoubtedly indicates the high level of biodiversity of the Maddalena Mountains, an area that until now did not attract explorations by botanists.

The number of new or confirmed units at the regional level underlines the fact that floristic knowledge of Basilicata and Campania cannot yet be considered satisfactory, despite numerous publications produced in recent years (e.g. Azzella et al. 2014, Bernardo and Caldararo 2014, Rosati et al. 2012, 2015, Bonari et al. 2016, Roma-Marzio et al. 2016, Stinca et al. 2016, 2017). It should be emphasized that several collected units are linked to wetlands that risk to disappear or to become altered both globally and locally. Finally, the limited number of surveyed exotic species can be considered as an indicator of the favourable conservation status of the investigated territories that are characterized mostly by natural/semi-natural habitats or by traditional arable land of mountainous areas.

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Supplementary material I

Supplementary data

Authors: Leonardo Rosati, Vito Antonio Romano, Fabrizio Bartolucci, Liliana Bernardo, Daniela Bouvet, Laura Cancellieri, Giuseppe Caruso, Fabio Conti, Francesco Faraoni, Gabriele Galasso, Edda Lattanzi, Paolo Lavezzo, Simonetta Peccenini, Enrico Vito Perrino, Giovanni Salerno, Adriano Sciandra, Adriano Soldano, Adriano Stinca, Chiara Totta, Simonetta Fascetti

Data type: Word .doc file

Explanation note:

1. Study area. Surveyed sites are marked with red squares (for details see Suppl. material 1: 3 and 7–8).
2. Thermo-pluviometric diagram of two representative stations of Maddalena Mountains. Observation period of Moliterno station: 1923–2007; Sala Consilina: 1975–1995. Data from “Annali idrologici, Ministero dei lavori pubblici, Servizio idrografico”. Solid line: average monthly values; dashed lined: average monthly maximum temperature; point-dashed line: average monthly minimum temperature.
3. Coded locality and geographical features of surveys. Coordinates are reported with decimal degrees WGS84. For detailed topographic map of each sites see Suppl. material 1: 7–8.
4. The 24 participants of the excursion of the Italian Botanical Society to the Maddalena Mountains, plus P. Scelzo, the Mayor of Brienza, (the second at the bottom from the left) during the visit to the mediaeval Caracciolo's Castle (courtesy of the Municipality of Brienza). Photo V.A. Romano.
5. Herbarium acronyms and institutions where the collected samples are stored.
6. Floristic list of taxa surveyed in the Maddalena Mountains.
7. Topographic map of surveyed sites (1–6). Floristic sampling sites are coded according to Supplementary 1 and 3; the cells grid is 1 × 1 km.
8. Topographic map of surveyed sites (7–12). Floristic sampling sites are coded according to Suppl. material 1: 1 and 3; the cells grid is 1 × 1 km.

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Global and Regional IUCN Red List Assessments: 3

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Abstract

In this contribution, the conservation status assessment of four vascular plants are presented according to IUCN categories and criteria. It includes the assessment at global level of *Crepis lacera* Ten subsp. *titani* (Pamp.) Roma-Marzio, G.Astuti & Peruzzi and *Anthyllis hermanniae* L. subsp. *sicula* Brullo & Giusso and the regional assessment of *Commicarpus plumbagineus* (Cav.) Standl. (Spain and Europe) and *Ambrosia maritima* L. (Italy).

Keywords

conservation, extinction risk, IUCN protocol, threats

Introduction

The text of the global and regional assessment should be submitted electronically to Simone Orsenigo (simone.orsenigo@unimi.it) or to Giuseppe Fenu (gfenu@unica.it); text up to 8000 characters in length (space included) must include a distribution map and a picture of the assessed species.

Crepis lacera Ten. subsp. *titani* (Pamp.) Roma-Marzio, G.Astuti & Peruzzi

Global assessment

Taxonomy and nomenclature

Order: Asterales Family: Asteraceae

Crepis lacera Ten. subsp. *titani* (Pamp.) Roma-Marzio, G.Astuti & Peruzzi, Phytotaxa 208(1): 50 (2015)

≡ *Crepis lacera* f. *titani* Pamp., Boll. Mus. Republ. San Marino 4: 118 (1920)

≡ *Crepis lacera* var. *titani* (Pamp.) Fiori, Nuov. Fl. Italia 2: 839 (1928)

Common name: Radicchiella del Monte Titano (It)

Geographic distribution range: *Crepis lacera* subsp. *titani* (Fig. 1) is an Italian endemic, confined to Marche (extending to San Marino Republic) and Abruzzo regions (Peruzzi et al. 2014 online updates, Roma-Marzio et al. 2015). To date, this taxon is known from 9 localities, which are split into two main groups in Central Italy that could be considered as separate sub-populations due to their geographical separation.

The northernmost group (including the *locus classicus*) is located in part within the borders of the San Marino Republic and in part within the Marche region (Natural Reserve of “Gola del Furlo”). The second one is located in southern Abruzzo (Gole del Sagittario National Reserve; Gole di San Venanzio within the Sirente-Velino Regional Park, and Vallone di Pennapiedimonte within the Majella National Park) (Roma-Marzio et al. 2015) (Fig. 2).

Distribution: Countries of occurrence: Italy and San Marino Republic



Figure 1. Individual in bud of *Crepis lacera* subsp. *titani* on limestone cliffs of Monte Titano (San Marino Republic). Photograph by L. Peruzzi.

Biology: Plant growth form: perennial (hemicryptophyte)

Flowering time: From May to July

Reproduction: No information on pollination strategy or seed germination is available.

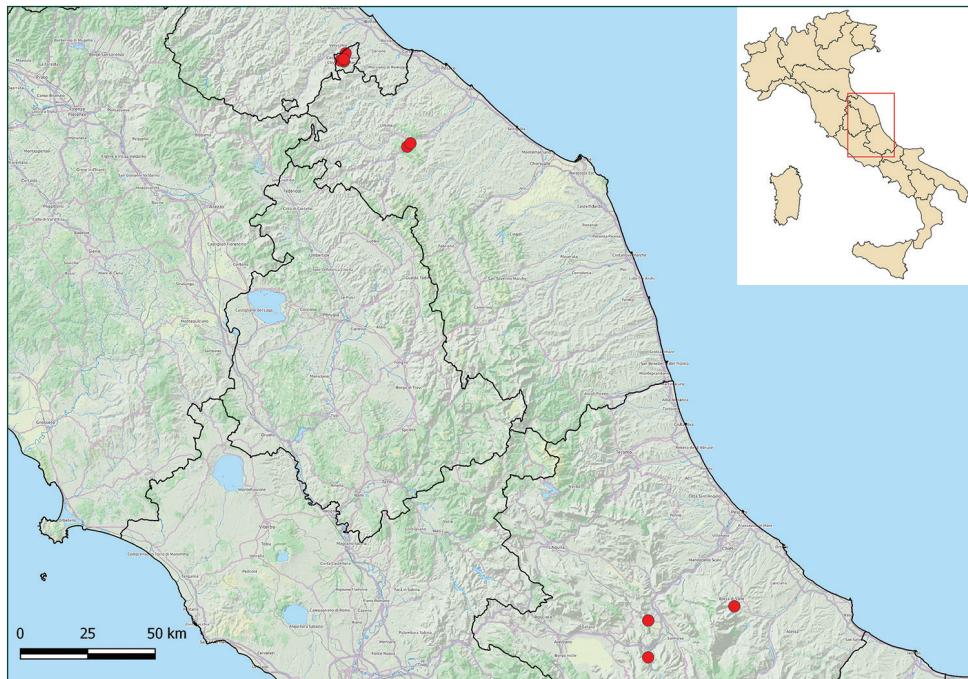


Figure 2. Geographic range and distribution map of *Crepis lacera* subsp. *titani*.

Habitat and Ecology: The preferred habitat of *Crepis lacera* subsp. *titani* is represented by stony pastures and calcareous cliffs. This species typically occurs in chasmophyte communities on limestone, assigned to the *Crepidio titani-Brassicetum robertianae* Biondi & Vagge, 2004 (Biondi and Vagge 2004, Roma-Marzio et al. 2015).

Population information: There is no information available on population dynamics.

Threats: 1.1. *Housing & urban areas*: some sites are threatened by the proximity to urban areas.

2.3. *Livestock and farming and ranching*: some sites are subjected to trampling and grazing by nomadic domestic animals.

CRITERIA APPLIED:

Criterion B: **EOO:** 4941 km² calculated with minimum convex hull polygon in QGIS 2.18

AOO: 28 km² calculated with a 2 × 2 km fixed cell grid

a) Number of locations: the following five locations have been identified according to threats 1.1 and 2.3: San Marino, Gola del Furlo (Marche region) and three other locations in Abruzzo

b) No documented decline in EOO (i), AOO (ii), area, extent and/or quality of habitat (iii), number of subpopulations (iv) or number of mature individuals (v)

c) No extreme fluctuations

Red List category and Criteria (Global Assessment)

LC	Least Concern
----	---------------

Rationale for the assessment: *Crepis lacera* subsp. *titani* is an Italian endemics (Roma-Marzio et al. 2015), which occurs in a few sites in Central Italy. Despite the small size of the global population, its proximity to urban areas and the potential grazing impact, there is no evidence of a decline. For this reason, this taxon is assessed as Least Concern at a global level.

Previous assessment: The taxon was not evaluated previously (NE) (IUCN 2016).

Conservation actions: Some populations of *Crepis lacera* subsp. *titani* partially occur within the Gola del Furlo Natural Reserve and Montecchio Natural Park. The localities from Abruzzo, are within the following Sites of Community Importance (SCIs): Gola del Sagittario (IT7110099), Gole di San Venanzio (IT7110096), and Maiella (IT7140203).

Conservation actions needed: To improve the management of plants occurring in pastures and urban habitats. Further monitoring efforts are needed in order to better understand population trends. *Ex situ* conservation in seed banks is recommended.

Francesco Roma-Marzio, Giovanni Astuti, Fabrizio Bartolucci, Fabio Conti,
Adriano Stinca, Lorenzo Peruzzi

Anthyllis hermanniae L. subsp. *sicula* Brullo & Giusso

Global assessment

Taxonomy and nomenclature

Order: Fabales *Family:* Fabaceae

Anthyllis hermanniae L. subsp. *sicula*, Novon 16: 310 (2006).

Common name: Vulneraria spinosa di Sicilia; Spina pollice siciliana (It); Anthyllide d'Hermann sicilienne (Fr); Sicilian yellow kidney-vetch (En).

Geographic distribution range: *Anthyllis hermanniae* subsp. *sicula* was endemic of the Sicilian biogeographical province (Brullo et al. 1995). It was found by Gussone (1828) near Torre Falconara (between Gela and Licata) and Palmi (today Palma di Montechiaro). There is also an herbarium specimen collected near Terranova (today Gela) by Citarda (FI and PAL). *Anthyllis hermanniae* subsp. *sicula* now appears to be extinct as numerous field surveys have failed to find it.

Distribution: Countries of occurrence: Italy (Sicily).

Biology: *Plant growth form:* perennial (chamaephyte).

Flowering and fruiting time: From May to June, fruiting from June to July.

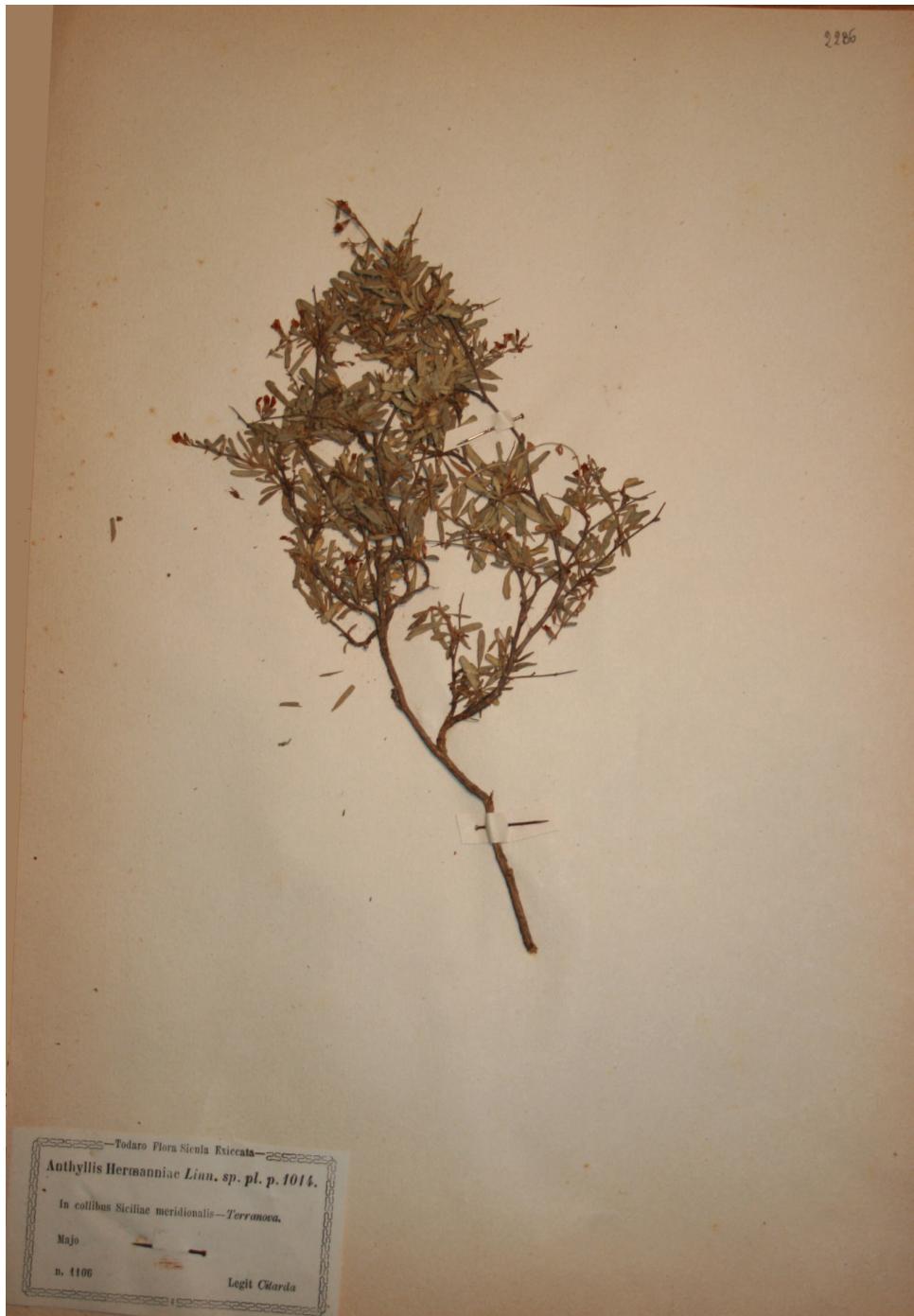


Figure 3. Herbarium specimen of *Anthyllis hermanniae* subsp. *sicula* (PAL herbarium)

Reproduction: No information is available on pollination, dispersal strategy and seed germination.

Habitat and Ecology: Review of herbarium specimens and the literature suggest that this taxon was restricted to calcareous substrates in a small coastal area of southern Sicily. Currently, this area is severely degraded, since both urban sprawl and agriculture have significantly transformed natural habitats. As a consequence, (sub)nitrophilous or ruderal vegetation types are widespread in the area where this plant was recorded until the nineteenth century. *Anthyllis hermanniae* subsp. *sicula* probably disappeared due to urbanization (legal and/or illegal) of the coastal areas, intense exploitation for tourism and related recreational activities, especially resorts, bathing facilities and second homes, as well as for the expansion of agriculture that has affected coastal natural habitats of southern Sicily in the last 50 years.

Population information: No information is available.

CRITERIA APPLIED:

Recent field surveys focused on finding the species in its historical area of occurrence were unsuccessful. The only existing herbarium specimens date to the nineteenth century.

Red List category and Criteria (Global Assessment)

EX | Extinct



Figure 4. Geographic range and distribution map of *Anthyllis hermanniae* subsp. *sicula*.

Previous assessment: The taxon has been already considered extinct (EX) by Brullo and Giusso del Galdo (2006).

Notes: *Anthyllis hermanniae* subsp. *sicula* belongs to a species complex which is widespread in the eastern Mediterranean, with some disjunct sometimes punctiform, ranges, in the central and western Mediterranean. In particular, the eastern populations (i.e. Montenegro, Albania, Greece, Crete, Aegean Islands and western Turkey) are morphologically relatively homogenous (*Anthyllis hermanniae* subsp. *hermanniae*), while those from the central and western Mediterranean show a remarkable morphological and ecological variability, being found on different substrates ranging from the sea level to 2,100 m a.s.l. In addition, the central-western Mediterranean populations show a very scattered distribution, and are morphologically different, especially in terms of the shape and size of the flower parts. Six subspecies (i.e. subsp. *melitensis*, *japygica*, *brutia*, *sicula*, *ichnusae*, and *corsica*) have been recognized occurring in Malta, Apulia, Calabria, Sicily, Sardinia and Corsica respectively. *A. hermanniae* subsp. *japygica* and subsp. *brutia* was classified as CR (Critically endangered) by Rossi et al (2013).

Gianpietro Giusso del Galdo

Commicarpus plumbagineus (Cav.) Standl.

Regional assessment (Spain and Europe)

Taxonomy and nomenclature

Order: Caryophyllales Family: Nyctaginaceae.

Commicarpus plumbagineus (Cav.) Standl. in Contr. U.S. Natl. Herb. 18(3): 101 (1916).
≡ *Boerhavia plumbaginea* Cav., Icon. 2: 7, tab. 112 (1793). ≡ *Commicarpus africanus* sensu Dandy in F.W.Andrews, Fl. Pl. Anglo-Egypt. Sudan 1: 152 (1950).

Common name: Dondiego de fruto pringoso (Es).

Geographic distribution range: *Commicarpus plumbagineus* (Fig. 5) is distributed across C and E Africa, the Middle East and the Mediterranean. In Europe, it is only found in SE Spain (Fig. 6), in the provinces of Alicante, Almeria and Murcia. In Alicante, there are three subpopulations: Sierra de Orihuela, where Cavanilles described the species (1793), Sierra de Callosa (Willkomm and Lange 1862) and Sierra de la Seldeta in the N of the province (Soler et al. 1995). In Almeria, there is a single subpopulation, which was discovered in La Sierrecica by Ruiz de la Torre and Ruiz del Castillo (1974). In Murcia, two subpopulations are known in Alhama de Murcia and Monteagudo (Esteve-Chueca 1959, Sánchez-Gómez et al. 2002). Records from Aguilas and Lorca (no available herbarium specimens) have been dismissed following intense fieldwork and taxonomical confusion has been assumed.

Distribution: Countries of occurrence: Angola, Arabia, Bahrain, Botswana, Burundi, Cameroon, Chad, Djibouti, Egypt, Eritrea, Ethiopia, Iran, Israel, Jordan, Kenya,



Figure 5. Flowers of *Commicarpus plumbagineus* in Sierra de Orihuela (Alicante, Spain). Photograph by L. Serra.

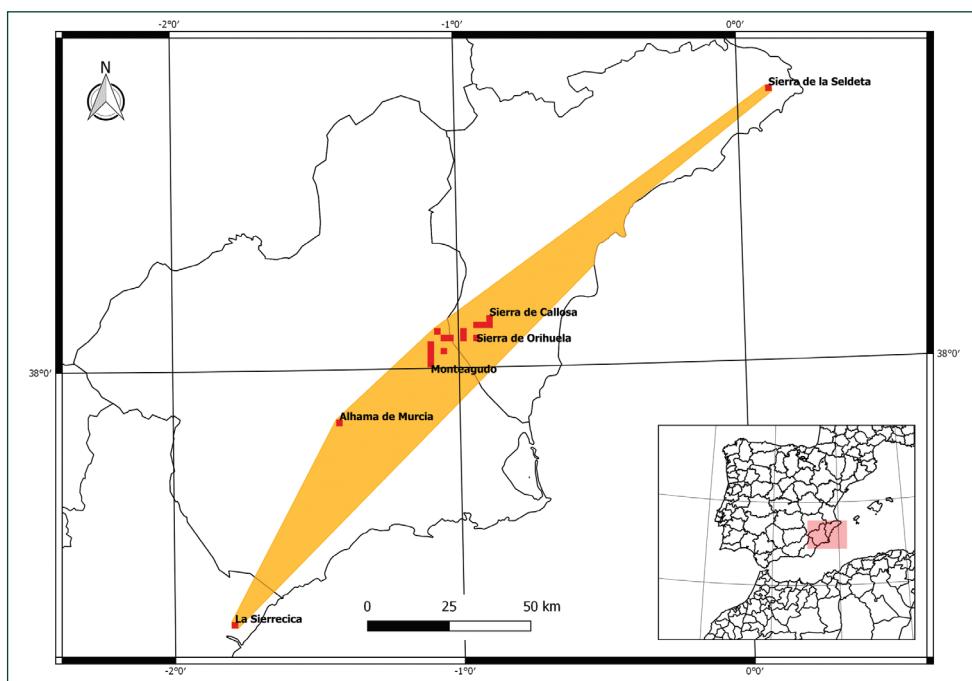


Figure 6. Extent of occurrence (orange) and area of occupancy (red) of *Commicarpus plumbagineus* in Spain.

Lebanon, Madagascar, Malawi, Mozambique, Namibia, Nigeria, Oman, Palestine, Rwanda, Saudi Arabia, Senegal, Somalia, South Africa, Spain, Sudan, Swaziland, Syria, Tanzania, Uganda, Yemen, Zaire, Zambia, Zimbabwe.

Biology: *Plant growth form:* Perennial herb (chamaephyte).

Flowering and fruiting time: From late May to November.

Reproduction: Insect pollination, zochory.

Habitat and Ecology: *Commicarpus plumbagineus* grows at the base of dry and sunny rocky places, on diverse substrates, in subnitrophilous subrupicolous plant communities of the class *Parietariales* Rivas-Martínez in Rivas Goday 1964.

Population information: Censuses made between 2005 and 2015 resulted in 140 individuals in the province of Alicante, 30 in Almeria and 400-500 in Murcia.

Threats: 1.1 *Housing & Urban areas:* most of the populations are close to urban areas.

2.1 *Annual & perennial non-timber crops:* the population in the province of Almeria is located in an intensive agricultural area.

3.2 *Mining & quarrying:* several populations are threatened by the expansion of quarries.

4.1 *Roads & railroads:* the only population in Almeria is surrounded by a road and a motorway, and the populations in Alhama and Monteagudo are close to the access routes to castles.

6.1. *Recreational activities:* individuals of Alicante's populations have been removed by rock-climbing activities. Hikers may also represent a threat for all populations.

7.1. *Fire & Fire Suppression:* in Alicante some individuals have been affected by forest fires.

8.1.2 *Invasive Alien Species (named species):* in Sierras de Callosa and Orihuela competition with invasive species such as *Opuntia maxima* Mill. represents a serious threat .

CRITERIA APPLIED:

Criterion D: Number of mature individuals < 1,000

Red List category and Criteria (Regional Assessment):

VU	Vulnerable	D1
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Rationale for the assessment: *Commicarpus plumbagineus* is restricted to six European subpopulations in SE Spain. It has an extent of occurrence (EOO) of 3,062 km² and an area of occurrence (AOO) of 72 km². There is no evidence of a reduction in population size or extreme fluctuations. It lives in relatively inaccessible areas where few direct threats exist, although the proximity to urban areas and the existence of agricultural activities, quarries and roads, as well as the impact of rock-climbing may pose potential threats. The small number of mature individuals (< 1,000) and their poor recruitment capacity make it sensitive to disturbances. It is classed as Vulnerable category (VU D1) at both a national (Spain) and European level.

Previous assessment: Vulnerable (VU D2) in Moreno Saiz (2009).

Conservation actions: *Commicarpus plumbagineus* is listed as Vulnerable in the Region of Murcia legislation (50/2003 Decree) and as a Protected taxon without threat category in the Valencian Community (6/2013 Order).

Conservation actions needed: Further monitoring and research are recommended in order to better understand the reproductive biology and population trends of the species. Inclusion in the Andalusian catalogue of protected species and protection of those locations which are not yet included in protected areas are suggested.

Notes: *Boerhavia plumbaginea* Cav. was considered a synonym of *B. africana* Lour., but according to the description of Loureiro (1790: 16), *B. africana* does not belong to the *Commicarpus* genus (Meikle 1978) and is a synonym of *B. diffusa* L. However, in Spain, the name *Commicarpus africanus* (Lour.) Dandy has been used since it was published in *Flora Iberica* (Galán 1990).

Lahora Agustín, Mendoza-Fernández Antonio J., Robles Jesús, Serra Lluís,
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Ambrosia maritima L.

Regional assessment (Italy)

Taxonomy and nomenclature

Order: Asterales *Family:* Asteraceae

Ambrosia maritima L. Sp. Pl. 2: 988. 1753 [1 May 1753]

Common name: Ambrosia marittima (It); Sea Ambrosia or Sea Ragweed (En); Ambroisie maritime (Fr).

Geographic distribution range: *Ambrosia maritima* is endemic to the Mediterranean Basin (Tutin et al. 1976). According to Euro+Med database (Greuter et al. 2006), it occurs in almost all Mediterranean countries, even if it is likely to be extinct in France and it is doubtfully native from Morocco to Libya. Ali (2010) classifies it widespread, but its range is still unclear due to taxonomic issues and confusion with exotic American ragweed (introduced in the Mediterranean from the XIX century). Field and herbarium data suggest that it formerly occurred in several countries and it was presumably widespread in sandy coastal areas. Currently, its range is reduced to few records in Italy, Malta, Greece and Egypt.

Distribution: Countries of occurrences: Italy (Sardinia; doubtful in mainland and Sicily), Malta, Greece (Dodecanese), Egypt.

Biology: *Plant growth form:* biennial and short lived perennial (chamaephyte)

Flowering time: *Ambrosia maritima* flowers from July (August) to October; ripe fruits occur in September and October.



Figure 7. *Ambrosia maritima* in Sardinia: plants in their coastal dunes habitat, comparison between leaves of *A. maritima* and exotic ragweeds *A. artemisiifolia* (a) and *A. psilostachya* (b). Photographs by C. Montagnani.

Reproduction: Wind-pollination; preliminary tests on seed show a very low/null germination rate (unpublished data); seed primary dispersal type is barochory.

Habitat and Ecology: Based on herbarium records and field studies, *A. maritima* is restricted to coastal dunes. Ali (2010) classifies it as ruderal in Egypt, occurring also in riparian habitats. In Italy, any recent *Ambrosia* records from ruderal habitats are attributable to exotic ragweeds. In Sardinia, the only extant population grows on fixed dunes, connected to back-dune formations dominated by *Juncus* spp. Data from Italian herbarium specimens indicate that in the past it also occurred on gravel beaches and occasionally in coastal saltworks.

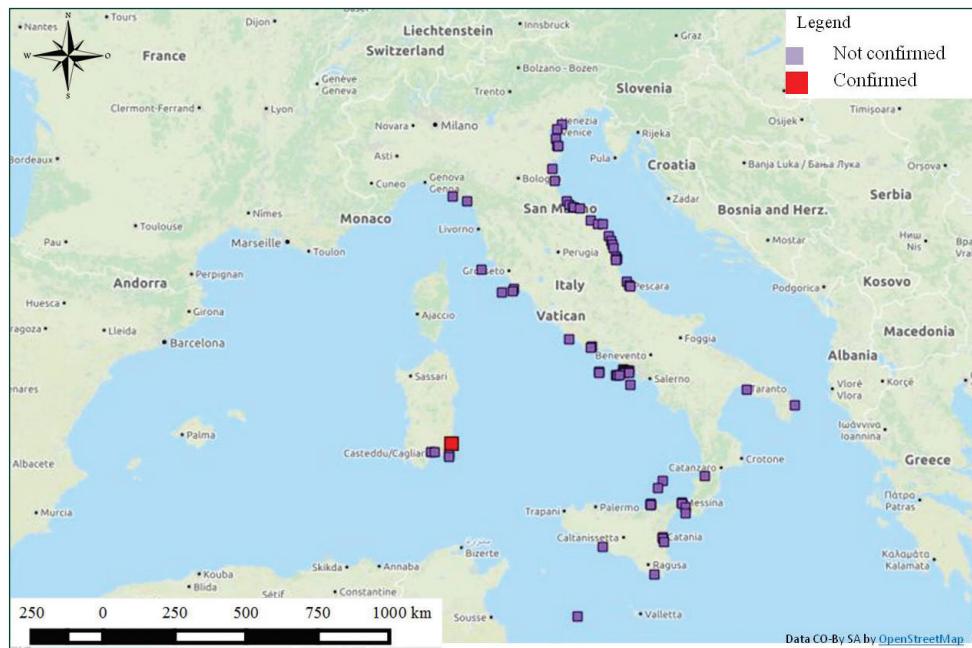


Figure 8. Italian distribution map of *Ambrosia maritima* based only on verified sites and herbarium specimens.

Population information: Populations have declined at both Italian and European levels and today a large number of records cannot be confirmed. Extinctions occurred both in historical and recent times. There is no detailed information available on population dynamics, but the number of mature individuals at each site can be extremely low and consequently its reproductive fitness limited.

Threats: *1.3. Tourism and recreational areas:* The species has recently disappeared from several sites due to building of resorts.

6.1. Recreational activities: Populations that grew near areas which are popular with tourists during the summer, may have been negatively affected by human trampling.

8.1. Invasive Non-Native/Alien Species/Disease: Historical sites which supported *A. maritima* now support large populations of *A. psilostachya* DC. (perennial ragweed) that can also colonize sandy coastal habitats.

CRITERIA APPLIED:

Criterion B: **AOO:** 4 km² calculated with a 2×2 km cell fixed grid

EOO: 4 km²

- a) Number of locations: one (according to threats 1.3, 6.1, 8.1)
- b) Decline in EOO (i), AOO (ii), quality and extent of habitat (iii), number of subpopulations (iv).

Criterion C: small population size (<250 mature individuals), an observed continuing decline and:

- a) number of mature individuals in each subpopulation <50 (i);

b) % of mature individuals in one subpopulation = 90–100% (ii)

Criterion D: Number of mature individuals <50

Red List category and Criteria (Italian Assessment)

Rationale for the assessment: according to recent data, in Italy *A. maritima* is confirmed only in one site in south-eastern Sardinia, where only two mature individuals were recorded in 2016. Not all historical sites can be confirmed. The decline has been

CR

Critically Endangered

B1ab(i,ii,iii,iv)+B2ab(i,ii,iii,iv)+C2a(i,ii)+D

estimated based on the disappearance of this *taxon* from two Sardinian sites where it was recorded at the end of the 80's. In Sardinia, the extinction of *A. maritima* is very likely due to the building of new tourist resorts. The extant population is very small in terms of spatial extension and number of mature individuals. For this reason this plant is considered as Critically Endangered at a regional level (Italy).

Previous assessment: Least Concern (LC) in Ali (2010) at Mediterranean level.

Conservation actions: *Ambrosia maritima* is not protected by international, national or regional laws. Seeds from the Sardinian population have been collected and their viability and germination tested. The Mediterranean distribution is under investigation (field and herbarium research) in order to understand where the species is still extant.

Conservation actions needed: Research activities are recommended to better understand its reproductive biology, ecology and current distribution and solve taxonomic issues; monitoring programs are strongly encouraged in order to conserve the small Sardinian population and further research should be encouraged in Mediterranean coastal areas in order to reveal possible undiscovered sites. Field research is strongly needed to verify whether the *taxon* could be present also in other parts of southern Italy (e.g. Apulia and Sicily) where the species has been reported in recent times, but findings were not supported by photographs or herbarium specimens.

Notes: Some authors consider that *A. maritima* could be an exotic ragweed introduced to the Mediterranean areas in ancient times (due to its medicinal properties). Others doubt that it is a Mediterranean endemic (Essl et al. 2015) and consider it a synonym of *A. senegalensis* from tropical Africa (The Plant List 2013). To date, the taxonomic relations of *A. maritima* L. are unclear. The misidentification of *A. maritima* increases the level of confusion with invasive American ragweeds (mainly *A. psilostachya*). This problem is mainly related to the lack of reliable identification keys. Very recently, a new identification key to ragweeds was published by the working group of the EU-Cost-Action SMARTER (Karrer et al. 2016). The oldest Italian herbarium specimen of *A. maritima* dates back at least to the XVI century (herbarium Aldrovandi) and it might have been collected on the Adriatic sea nearby Ancona, where Aldrovandi wrote that he often found the species (<http://botanica.sma.unibo.it/>). Given the reduced size of the only confirmed population, *A. maritima* deserves maximum attention.

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Gianluca Nicolella, Gerhard Karrer.

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Bryological flora of the regional historic Park of Monte Sole (Emilia-Romagna, Italy)

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Abstract

This article presents the results of a study on the bryological flora of the historic Park of Monte Sole, in the Bologna Apennines (Emilia-Romagna region). A total of 129 taxa were identified, including 9 new findings for the region. The study makes use of the regional cartographic grid, a methodology already used in the description of the vascular flora of the region, applied here for the first time to the bryological flora. If used in future studies, this method will allow a standardization of our knowledge on the distribution of the bryological flora in the region.

Keywords

Flora, Bryophytes, Northern Apennines, Emilia-Romagna, European Floristic Cartographic Grid

Introduction

In recent years, research on bryophytes in the administrative region of Emilia-Romagna (Italy) has been undergoing a new surge after several years of neglect, thanks also to the publication of the moss flora of Italy (Cortini-Pedrotti 2001, 2005) and, at a European level, of the analytical key for the description of liverworts (Schumacker and Vána 2005).

The first decades of the new millennium have seen two important studies on bryophytes in Emilia-Romagna, one focusing on the Parco dei Gessi bolognesi e Calanchi dell'Abbadessa (Aleffi and Silenzi 2000) and the other on gypsum outcrops

(Aleffi et al. 2014). The present work concerns the historic Park of Monte Sole and is part of a project aimed to increase our knowledge of the bryological flora of the region. We have also attempted to systematize the presentation of the collected data by reporting our findings on the European floristic cartographic grid usually employed for floristic studies in Emilia-Romagna. Two of the most significant examples of the latter, dealing with vascular flora, include the atlas of protected species of Emilia-Romagna (Alessandrini and Bonafede 1996) and, more recently, the atlas of the ferns of Emilia-Romagna (Bonafede et al. 2016). Our case represents the first attempt to apply this method to the study of the bryological flora, with the aim of collecting and presenting the data in such a way as to be used effectively in subsequent bryological research in Emilia-Romagna and in other territories.

Area of study

The Park of Monte Sole (Fig. 1) has an extension of just under 6300 ha and is located in the municipalities of Marzabotto, Grizzana Morandi and Monzuno in the Apennines near Bologna. The park is bordered almost entirely, to the east and west, by two water courses: the Reno river to the west, and the Setta, one of its tributaries, to the east. Both water courses converge at the extreme north of the park. The altitude ranges from 90 to 823 m, the highest peak being that of Mount Salvaro. The geology includes various formations, the most substantial being the Loiano sandstones in the eastern, central and southern zones of the park, and the Bismantova Group including sandstone-marl sediments (Pantano formation) and pelitic-sandstone (Cigarello formation) distributed to the north, centre and south of the park (Cazzoli 2003). Less extensive outcrops include the marls of Mount Piano and those of Termina, the Ronzano formation (marl rocks) and that of Antognola (alternation of marl and limestone layers), variously distributed within the park. The soils in the central-northern zone are highly variable in depth; they have a medium texture with good availability of oxygen, and are calcareous and slightly or moderately alkaline (Regione Emilia-Romagna 1994). In the central-eastern zone the soils are characterized by a greater, sometimes considerable, depth, a medium texture, and good availability of oxygen, and are calcareous and moderately alkaline. In the central and southern part they are deep or very deep, with a medium texture and good availability of oxygen; they range from moderately to slightly alkaline both at the surface and deeper down, with a high variability in carbonate content, or are non calcareous, ranging from moderately to highly acid at the surface, to moderately or slightly acidic at greater depth.

According to the phytoclimatic map of Emilia-Romagna, the climate is that of the warm sub-Mediterranean belt (central-Emilian hill landscape; Ubaldi et al. 1996), that is to say with a mean annual temperature between 11.5 and 13 °C and annual temperature range of 18–22 °C (sub continental-continental climate). Mean annual precipitation ranges from 800 to 1000 mm and throughout the region reaches an absolute maximum in autumn and a secondary maximum in spring. There is a xerothermic period in the months of July and August oscillating in 20-year cycles between arid ($P=2T$) and sub-arid ($P=3T$) conditions. More precisely, in the period 1991–2005 the weather station of Sasso Marconi, a small town very close to the northernmost portion of the park, recorded a

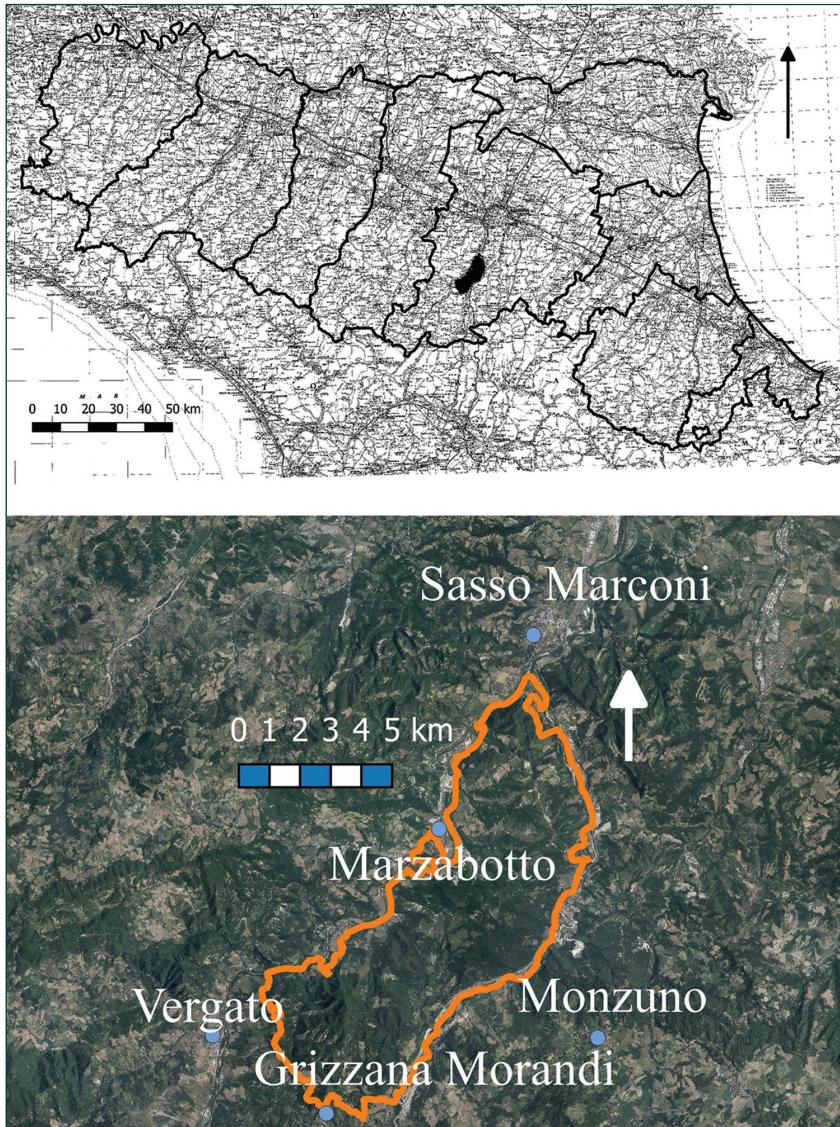


Figure 1. The Park of Monte Sole.

mean annual temperature of 14.3 °C, a thermal annual excursion of 20.4 °C and a mean annual precipitation of 751 mm (data collected from the ARPA site for Emilia-Romagna: <http://www.arpae.it>). A period of drought occurs in the month of July. Compared to the data of the phytoclimatic map, the period under examination was characterized by higher temperatures and lower precipitations.

The vegetation consists of woodland with hop-hornbeam and turkey oak belonging to the order *Quercetalia pubescenti-petraeae* Klika, 1933, which according to a recent classification (Blasi et al. 2004) falls within the alliance *Carpinion orientalis* Horvat, 1958, or of woodland with downy oak or downy oak and turkey oak within the same

alliance (Puppi et al. 1996). Woods of the alliance *Erythronio dens-canis-Quercion petraeae* Ubaldi, (1988) 1990 are also widespread, consisting of chestnut groves or mixed woods of chestnut with turkey oak, downy oak, durmast oak and aspen. Along the water courses riparian woods of *Populetalia albae* Br.-Bl. ex Tchou, 1948 and *Salicetalia purpureae* Moor, 1958 can be found.

Materials and methods

The samples were collected from summer 2014 to spring 2016, mostly in early spring, and were kept in the bryological herbarium of one of the authors.

The findings were documented using the cartographic grid adopted in the floristic cartography of Central Europe and also used in Emilia-Romagna, with an interval of 6° latitude × 10° longitude. As reported in Alessandrini and Bonafede (1996) each area thus derived is called a basic area and is identified by two numbers: the first refers to the row and the second to the column. Each basic area is divided into 4 quadrants indicated by the numbers 1, 2, 3 and 4; the quadrant represents the cartographic unit of reference. At the latitudes of Emilia-Romagna, it has mean dimensions of around 6.625 km longitude × 5.550 km latitude. The Park of Monte Sole lies within columns number 32 and 33 and rows 116 and 117 (Fig. 2). The cartography used for Figures 1 and 2 was taken from the sites of Emilia-Romagna: <https://geoportale.regione.emilia-romagna.it> and <http://ambiente.regione.emilia-romagna.it>.

The survey of the territory was not uniform, but concentrated on the areas considered most significant from a bryological point of view. The nomenclature follows Ros et al. (2013) for mosses and Aleffi et al. (2008) for liverworts.

Results

The list of species identified (Table 1) consists of 129 taxa (17 liverworts and 112 mosses) including nine new findings for the Region (Aleffi et al. 2008): *Barbilophozia barbata*, *Marchesinia mackaii*, *Pedinophyllum interruptum*, *Archidium alternifolium*, *Atrichum angustatum*, *Fissidens gracilifolius*, *Gymnostomum viridulum*, *Schistidium helveticum* and *Thuidium assimile*. In addition, five species were found whose last record dated back to before 1950 (Aleffi et al. 2008): *Lophocolea minor*, *Leptobarbula berica*, *Mnium lycopodioides*, *Orthotrichum cupulatum* var. *cupulatum* and *Schistidium crassipilum*. The asterisk (*) indicates the new species for Emilia-Romagna. Overall, the species present in the park constitute 24.1% of the regional flora.

Discussion

Among the species collected, the finding of *Marchesinia mackaii*, a southern Atlantic species previously reported in Italy only for Trentino-Alto Adige, Liguria, Toscana,

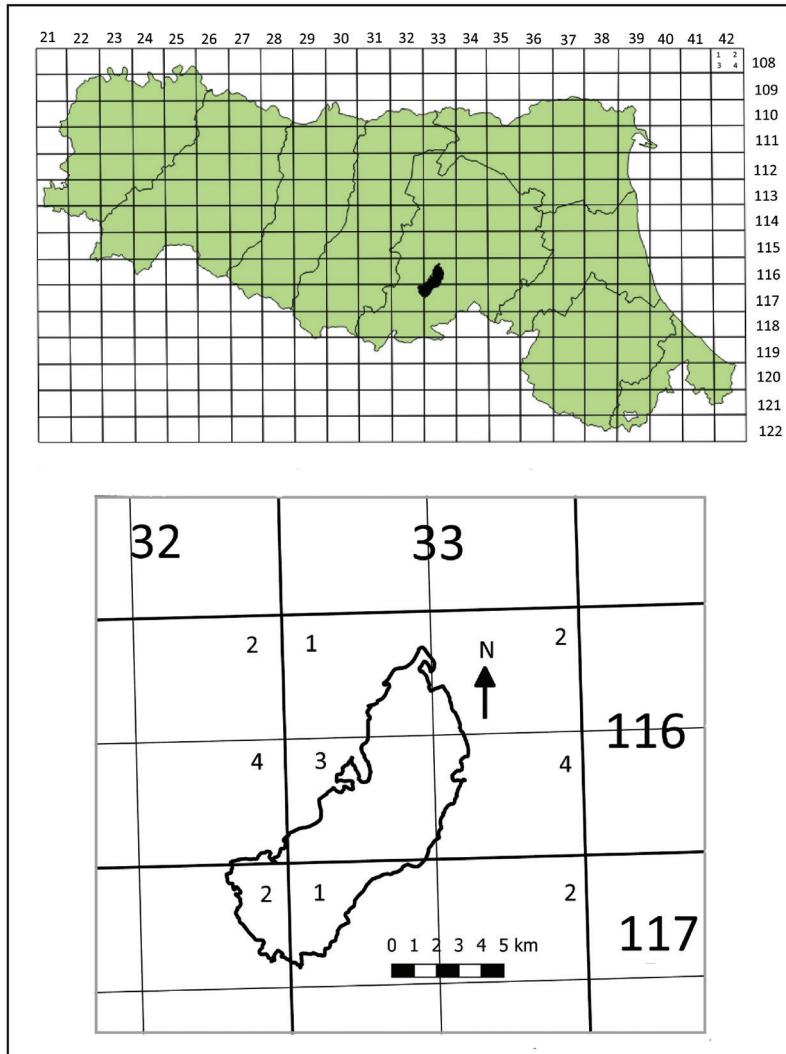


Figure 2. Cartographic grid of the Emilia-Romagna administrative region and, in detail, of the Park of Monte Sole.

Lazio and Campania is particularly interesting (Aleffi et al. 2008). *M. mackaii* grows primarily on shaded basic rocks, typically on vertical faces within woodland, in colonies of flattened worm-like shoots. Another interesting finding is *Fissidens gracilifolius*. This temperate-montane species grows directly on limestone rock in a range of wet or dry habitats; it was reported for Trentino-Alto Adige, Toscana, Marche, Abruzzo, Puglia and Sicilia (Aleffi et al. 2008). The finding of *Leptobarbula berica* is significant since the last record for Emilia-Romagna dates back to a generic report by Fiori (1886). The only recent reports are for Piedmont, Friuli-Venezia Giulia, Campania, Puglia and Sicily. This Mediterranean-Oceanic species forms low lawns or deeper patches on horizontal or sloping silty soils.

Table I. List of the species identified in the different quadrants.

Taxa	11633-1	11633-2	11633-3	11633-4	11733-1	11732-2
Hepatics						
* <i>Barbilophozia barbata</i> (Schmidel ex Schreb.) Loeske					x	
<i>Cephalozia bicuspidata</i> (L.) Dumort.					x	
<i>Cephaloziella baumgartneri</i> Schiffn.	x		x			
<i>Frullania dilatata</i> (L.) Dumort.			x		x	x
<i>Jungermannia gracillima</i> Sm.				x		x
<i>Leiocolea turbinata</i> (Raddi) H. Buch			x	x		x
<i>Lejeunea cavifolia</i> (Ehrh.) Lindb.			x	x		x
<i>Lophocolea bidentata</i> (L.) Dumort.						x
<i>Lophocolea heterophylla</i> (Schrad.) Dumort.			x	x	x	x
<i>Lophocolea minor</i> Nees			x			x
* <i>Marchesinia mackaii</i> (Hook.) Gray						x
<i>Metzgeria furcata</i> (L.) Dumort.			x			
* <i>Pedinophyllum interruptum</i> (Nees) Kaal.						x
<i>Plagiochila poreloides</i> (Torrey ex Nees) Lindenb.					x	x
<i>Porella arboris-vitae</i> (With.) Grolle			x			
<i>Porella platyphylla</i> (L.) Pfeiff.			x		x	x
<i>Radula complanata</i> (L.) Dumort.	x	x	x		x	x
Mosses						
<i>Allenella complanata</i> (Hedw.) S. Olsson, Enroth & D. Quandt			x			
<i>Amblystegium serpens</i> (Hedw.) Schimp.		x	x	x	x	x
<i>Anomodon viticulosus</i> (Hedw.) Hook. & Taylor	x	x			x	
* <i>Archidium alternifolium</i> (Hedw.) Mitt.					x	
* <i>Atrichum angustatum</i> (Brid.) Bruch & Schimp.			x		x	
<i>Atricum undulatum</i> (Hedw.) P. Beauv.					x	
<i>Barbula convoluta</i> Hedw. var. <i>convoluta</i>						x
<i>Barbula unguiculata</i> Hedw.	x	x	x		x	x
<i>Brachythecium glareosum</i> (Bruch ex Spruce) Schimp.			x			x
<i>Brachythecium rivulare</i> Schimp.		x	x			x
<i>Brachythecium rutabulum</i> (Hedw.) Schimp.		x	x	x	x	x
<i>Brachythecium salebrosum</i> (Hoffm. ex F. Weber & D. Moor) Schimp.						x
<i>Bryoerythrophyllum recurvirostrum</i> (Hedw.) P.C. Chen			x			
<i>Bryum dichotomum</i> Hedw.		x				x
<i>Bryum radiculosum</i> Brid.					x	
<i>Calliergonella cuspidata</i> (Hedw.) Loeske						x
<i>Campyliadelphus chrysophyllus</i> (Brid.) R.S. Chopra	x		x	x	x	x
<i>Campylium stellatum</i> (Hedw.) Lange & C.E.O. Jensen	x	x	x		x	x
<i>Cirriphyllum crassinervium</i> (Taylor) Loeske & M. Fleisch.			x			x
<i>Cratoneuron filicinum</i> (Hedw.) Spruce		x	x		x	
<i>Ctenidium molluscum</i> (Hedw.) Mitt.	x		x	x	x	x
<i>Dicranella howei</i> Renaud & Cardot		x	x			
<i>Dicranella varia</i> (Hedw.) Schimp.				x		
<i>Dicranum scoparium</i> Hedw.			x			
<i>Didymodon acutus</i> (Brid.) K. Saito			x			
<i>Didymodon fallax</i> (Hedw.) R.H. Zander	x				x	x

Taxa	11633-1	11633-2	11633-3	11633-4	11733-1	11732-2
<i>Didymodon ferrugineus</i> (Schimp. ex Besch.) M.O. Hill						x
<i>Didymodon luridus</i> Hornsch.			x	x	x	x
<i>Didymodon sinuosus</i> (Mitt.) Delogne						x
<i>Didymodon tophaceus</i> (Brid.) Lisa						x
<i>Didymodon vinealis</i> (Brid.) R.H. Zander			x	x	x	x
<i>Ditrichum pusillum</i> (Hedw.) Hampe						x
<i>Encalypta streptocarpa</i> Hedw.	x		x	x	x	
<i>Encalypta vulgaris</i> Hedw.			x			
<i>Eucladium verticillatum</i> (With.) Bruch & Schimp.			x			x
<i>Eurhynchiastrum pulchellum</i> (Hedw.) Ignatov & Huttunen var. <i>pulchellum</i>		x	x			x
<i>Exsertotheca crispa</i> (Hedw.) S. Olsson, Enroth & D. Quandt			x	x		
<i>Fissidens dubius</i> P. Beauv.	x		x		x	x
* <i>Fissidens gracilifolius</i> Brugg.-Nann. & Nyholm			x			
<i>Fissidens taxifolius</i> Hedw. subps. <i>taxifolius</i>		x	x	x	x	x
<i>Grimmia pulvinata</i> (Hedw.) Sm.	x		x			
* <i>Gymnostoma viridulum</i> Brid.	x		x			
<i>Gyroweisia tenuis</i> (Hedw.) Schimp.	x					
<i>Homalothecium lutescens</i> (Hedw.) H. Rob.			x		x	
<i>Homalothecium sericeum</i> (Hedw.) Schimp.	x		x		x	x
<i>Hygroamblystegium tenax</i> (Hedw.) Jenn.			x			x
<i>Hygrohypnum luridum</i> (Hedw.) Jenn.			x			x
<i>Hypnum cupressiforme</i> Hedw. var. <i>cupressiforme</i>	x	x	x	x	x	x
<i>Hypnum cupressiforme</i> Hedw. var. <i>filiforme</i> Brid.			x			
<i>Hypnum cupressiforme</i> Hedw. var. <i>lacunosum</i> Brid.			x			
<i>Hypnum cupressiforme</i> Hedw. var. <i>resupinatum</i> (Taylor) Schimp.			x		x	
<i>Isopterygiopsis pulchella</i> (Hedw.) Z. Iwats.						x
<i>Isothecium alopecuroides</i> (Lam. ex Dubois) Isov.					x	x
<i>Kindbergia praelonga</i> (Hedw.) Ochyra	x	x	x	x	x	x
<i>Leptobarbula berica</i> (De Not.) Schimp.						x
<i>Leptodon smithii</i> (Hedw.) F. Weber & D. Mohr						x
<i>Leucodon sciuroides</i> (Hedw.) Schwägr.			x			
<i>Microeurhynchium pumilum</i> (Wilson) Ignatov & Vanderp.			x		x	x
<i>Mnium lycopodioides</i> Schwägr.			x			x
<i>Mnium stellare</i> Hedw.			x			x
<i>Orthotrichum affine</i> Schrad. ex Brid.		x	x			x
<i>Orthotrichum anomalum</i> Hedw.			x			x
<i>Orthotrichum cupulatum</i> Hoffm. ex Brid. var. <i>cupulatum</i>						x
<i>Orthotrichum diaphanum</i> Schrad. ex Brid.			x		x	x
<i>Orthotrichum striatum</i> Hedw.						x
<i>Orthotrichum tenellum</i> Bruch ex Brid.						x
<i>Oxyrrhynchium hians</i> (Hedw.) Loeske	x	x	x			x
<i>Oxyrrhynchium schleicheri</i> (R. Hedw.) Röll.					x	x
<i>Oxyrrhynchium speciosum</i> (Brid.) Warnst.		x				x
<i>Oxystegus tenuirostris</i> (Hook. & Taylor) A.J.E. Sm.			x			
<i>Plagiomnium affine</i> (Blandow ex Funck) T.J. Kop.		x	x			

Taxa	11633-1	11633-2	11633-3	11633-4	11733-1	11732-2
<i>Plagiommium cuspidatum</i> (Hedw.) T.J. Kop.			x			x
<i>Plagiommium elatum</i> (Bruch & Schimp.) T.J. Kop.			x			
<i>Plagiommium ellipticum</i> (Brid.) T.J. Kop.			x			
<i>Plagiommium medium</i> (Bruch & Schimp.) T.J. Kop.			x		x	x
<i>Plagiommium rostratum</i> (Schrad.) T.J. Kop.		x				x
<i>Plagiommium undulatum</i> (Hedw.) T.J. Kop.		x			x	x
<i>Pohlia melanodon</i> (Brid.) A.J. Shaw		x	x			x
<i>Pohlia wahlenbergii</i> (F. Weber & D. Mohr)			x			x
A.L. Andrews						
<i>Polytrichum formosum</i> Hedw.					x	
<i>Pseudoamblystegium subtile</i> (Hedw.) Vanderp. & Hedenäs			x			
<i>Pseudocrossidium hornschuchianum</i> (Schultz) R.H. Zander						x
<i>Pseudoleskeella nervosa</i> (Brid.) Nyholm		x				x
<i>Pterigynandrum filiforme</i> Hedw.					x	
<i>Ptychostomum capillare</i> (Hedw.) Holyoak & N. Pedersen	x		x	x	x	x
<i>Ptychostomum donianum</i> (Grev.) Holyoak & N. Pedersen	x		x			
<i>Ptychostomum imbricatulum</i> (Müll. Hal.) Holyoak & N. Pedersen						x
<i>Ptychostomum pallens</i> (Sw.) J.R. Spence			x		x	
<i>Ptychostomum torquescens</i> (Bruch & Schimp.) Ros & Mazimpaka			x		x	
<i>Rhynchostegiella curviseta</i> (Brid.) Lindb.			x			
<i>Rhynchostegiella tenella</i> (Dicks.) Limpr.		x	x	x		
<i>Rhynchostegium megapolitanum</i> (Blandow ex F.Weber & D.Mohr) Schimp.			x			x
<i>Rhynchostegium riparioides</i> (Hedw.) Cardot	x	x				x
<i>Schistidium crassipilum</i> H.H.Bлом			x			x
* <i>Schistidium helveticum</i> (Schkuhr) Deguchi						x
<i>Scleropodium touretii</i> (Brid.) L.F. Koch					x	
<i>Seligeria pusilla</i> (Hedw.) Bruch & Schimp.			x			x
<i>Syntrichia laevipila</i> Brid.						x
<i>Syntrichia montana</i> Nees			x			
<i>Syntrichia ruralis</i> (Hedw.) F. Weber & D. Mohr var. <i>ruralis</i>			x			
* <i>Thuidium assimile</i> (Mitt.) A. Jaeger						x
<i>Tortella flavorrens</i> (Bruch) Broth.	x			x	x	
<i>Tortella inclinata</i> (R.Hedw.) Limpr.			x			
<i>Tortella squarrosa</i> (Brid.) Limpr.			x			x
<i>Tortella tortuosa</i> (Hedw.) Limpr.			x	x	x	x
<i>Tortula lindbergii</i> Broth.		x	x			x
<i>Tortula muralis</i> Hedw.			x	x		x
<i>Tortula subulata</i> Hedw.			x		x	x
<i>Tortula vahliana</i> (Schultz) Mont.			x			
<i>Trichostomum brachydontium</i> Bruch			x			x
<i>Trichostomum crispulum</i> Bruch	x	x	x		x	x
<i>Zygodon rupestris</i> Schimp. ex Lorentz	x	x	x		x	

The area under investigation contains various different growth habitats for bryophytes. The first of these is the terrain. Here, some characteristic species of the class *Barbuleta unguiculatae* Mohan, 1978 and order *Barbuletalia unguiculatae* v. Hübschmann, 1960 were identified, such as *Barbula unguiculata*, *Ptychostomum capillare* and *Didymodon fallax*. Species characteristic of the alliance *Grimaldion fragrantis* Smarda & Hadac, 1944 are *Didymodon luridus*, *D. vinealis*, *Encalypta vulgaris*, *Tortella squarrosa* and *Pseudocrossidium hornschuchianum*. A second growth habitat for bryophytes are the stations with outcropping rocks, where some characteristic species were observed belonging to the classes *Grimmietea anodontis* Hadac & Vondracek in Jæzek & Vondracek, 1962 and *Ctenidietea mollusci* v. Hübschmann ex Grgic, 1980, both typical of calcareous substrates. The former class is represented by *Tortula muralis*, *Grimmia pulvinata*, *Schistidium crassipilum* and *Schistidium helveticum*, while the class *Ctenidietea* is represented by *Ctenidium molluscum*, *Tortella tortuosa*, *Encalypta streptocarpa* and *Fissidens dubius*. The epiphytic communities belong to the class *Frullanio dilatatae-Leucodontetea sciurooides* Mohan, 1978 em. Marstaller, 1985. The characteristic species surveyed in the investigated areas include *Frullania dilatata* and *Radula complanata*, as well as *Leucodon sciuroides*, *Orthotrichum affine*, *O. diaphanum* and *Zygodon rupestris*. The class *Neckeretea complanatae* Marstaller, 1986 is typical of communities that grow on trunks or basic rocks. The surveyed characteristic species are *Homalothecium sericeum*, *Porella platyphylla* and, less frequent but not rare, *Mnium stellare* and *Cirriphyllum crassinervium*. Finally, in the humid zones, particularly within the minor water courses where the species may be partially emerged for quite long periods during the dry season, especially in the smaller streams, some characteristics of the class *Plathypnidio-Fontinalietea antipyreticae* Philippi, 1956, were found, such as *Rhynchostegium riparioides*, the most common, and, more rarely, *Hygrohypnum luridum*, *Hygroamblystegium tenax*, *Oxyrrhynchium speciosum*; also present are *Cratoneuron filicinum* (in flowing waters) and *Brachythecium rivulare*, more at the margins, and in any case in stations ranging from very humid to wet.

Conclusions

This study not only represents a contribution to the knowledge of the bryological flora of Emilia-Romagna, but also provides results of both floristic and chorological interest. The relatively high number of species found is noteworthy, especially considering the limited extension of the area investigated. Moreover, since our knowledge of the distribution of bryophytes in Emilia-Romagna is extremely incomplete and because the only recently published works all deal with the gypsum outcrops of the region, the study covers an aspect that has not yet fully explored within the territory. The use of the European floristic cartographic grid to present the findings can also open the way to a more standardized description of the distribution data. These, if taken up in future studies, could lead to the creation of a regional database allowing the distribution of the species to be presented in a more homogenous manner, as has already been done in various cases for the vascular flora.

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