

Contribution to the floristic knowledge of Velino and Aterno valleys (Lazio-Abruzzo, central 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. The field trip was held in 2016 along the Velino and Aterno valleys located between Lazio and Abruzzo administrative regions (central Italy). The flora documented for the studied area amounts to 629 specific and subspecific taxa (including two hybrids)

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belonging to 300 genera and 69 families. Thirty-eight taxa are endemic to Italy, and only 16 alien taxa were detected. Thirty-eight taxa are included in the IUCN Red List of the Italian Flora. Twenty-four taxa have to be considered as floristic novelties because either new or confirmed for the regional flora of Lazio or Abruzzo. In particular, 15 taxa are new and 6 are confirmed for Lazio. Regarding Abruzzo, 2 taxa are new for the regional flora and one is confirmed. Furthermore, the alien status in Lazio has been updated for one taxon.

Keywords

Abruzzo, central Apennines, endemic, Lazio, floristic novelties, vascular flora

Introduction

Since 2003, 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 of Italy. The selection of the territories to be investigated has been mostly addressed to fill the gaps pointed out on the map of the floristic knowledge of Italy updated to 2005 (Anzalone et al. 2005; Conti et al. 2005). Here we present the results of the field trip held in 2016 in Central Italy, organised by the botanists of the CRFA (Barisciano, L'Aquila) and the DAFNE department of the Viterbo University (Suppl. material 1.1). The study area is located between Lazio and Abruzzo administrative regions, along the Velino and Aterno valleys, and includes territories on the edge of the group of M. Terminillo (Rieti) that span towards the wooded environments of Montereale (L'Aquila). Based on the mentioned map, this area had not been yet explored, apart from some studies (Anzalone et al. 2005; Conti et al. 2005; Del Vico et al. 2014).

Study area

The investigated area is localized in the Cittareale (Rieti) and Montereale (L'Aquila) municipalities, in the upper Velino valley and in the Aterno valley (Suppl. material 1.2). The altitude ranges from 760 m a.s.l. at the bottom of Velino valley, to 1824 m a.s.l. at the top of Monte Borrachine. The other main summits for the mountain sector of Lazio are Monte S. Venanzio and Monte la Speluca (both 1801 m a.s.l.), and Monte Verrico (1309 m a.s.l.) in Abruzzo.

The areas of Monte Borrachine and Capo d'Acqua are characterized by limestone. In the Velino valley, going from the top to the valley floor, there are marls and sandy clays, followed by Molasse and sandstones. The latter characterizes the areas between the village of S. Croce and Monte Verrico. The base of the Velino valley and the Montereale plain are characterized by floods (Servizio Geologico d'Italia 1955).

Rainfall is concentrated in the autumn–winter period, with a maximum in November–December and a minimum in summer (July–August), showing a two-month drought occurring during the summer. Annual average temperature ranges from 9.2 to 10.4 °C, with the hottest months in summer (July–August) and the coldest in winter (December–February). The Rivas-Martinez indices show that the investigated area shows

a temperate oceanic subcontinental macrobioclimate (Suppl. material 1.3), ranging from low supratemperate to low orotemperate humid/hyperhumid types (Del Vico et al. 2014).

The forest vegetation is dominated by coppice beech woods and secondly Turkey oaks forests. Along the medium-high altitude slopes, pastures are characterized by xerophilous *Bromopsis erecta* (Huds.) Fourr. communities, sometimes chamaephytic, and *Festuca* L. sp. pl. communities, both of which are more or less closed. Together with fragments of grasslands dominated by *Stipa dasyvaginata* Martinovský subsp. *apenninica* Martinovský & Moraldo, the northern sector of the study area hosts shrubs, mowing pastures and small fallows.

Materials and methods

To maximize vascular flora sampling, 13 sites were selected as representative of the local diversity in terms of climate, litho-morphology, and habitats (Suppl. material 1.2). The sites were intensively sampled during the period 15–18 June 2016 by 18 participants, and some further investigations by organizers on 29 March 2016, 15 and 29 April 2016, 23 March 2017, 2–3 June 2017 (Suppl. material 1.4). The floristic list followed the same methodology used in previous contributions (e.g., Rosati et al. 2017; Bouvet et al. 2018). The work, together with the floristic list, was coordinated and drawn up by the organisers with the contribution of all participants to the excursion. A revision of the samples collected during the field work was carried out at Centro Ricerche Floristiche dell'Appennino (23–25 February 2017), followed by specific studies and comparisons of unidentified taxa. Some herbarium specimens belonging to critical genera were sent to specialists for determination: *Alchemilla* L. (F. Festi, Rovereto), *Hieracium* L. and *Pilosella* Hill (G. Gottschlich, Tübingen), *Orobanche* L. (G. Domina, Palermo), *Oenothera* L. (A. Soldano, Vercelli), *Pulmonaria* L. and some specimens of *Cynoglossum* L. (L. Cecchi, Firenze), *Taraxacum* F.H. Wigg. (J. Štěpánek, Prague).

The nomenclature used to draw up the floristic list (see Suppl. material 1.6) follows the updated checklists of the vascular flora native (Bartolucci et al. 2018a, 2018b, 2018c) and alien (Galasso et al. 2018a, 2018b, 2018c) to Italy, with the exception of native hybrids, not considered in the above-mentioned checklists. The systematic order of the families follows Bartolucci et al. (2018c) and Galasso et al. (2018a). Taxa are ordered alphabetically within each family. For each taxon the following information is reported: accepted name, endemic, cryptogenic and alien status, sampling site (see Suppl. material 1.3), *Herbarium* (see Suppl. material 1.5).

Abbreviations or symbols used in the floristic list are:

- E** Italian endemic (Peruzzi et al. 2014, 2015; Bartolucci et al. 2018c)
- A** Alien taxa: [CAS (Casual), NAT (Naturalized), INV (Invasive)]
- C** Cryptogenic (doubtfully native taxon, whose origin of occurrence in Italy is unknown)
- ** New record for the regional flora
- * Taxon confirmed for the regional flora

Results

During the field investigations, 2,449 samples of vascular plants were collected, belonging to 629 species and subspecies, 300 genera, and 69 families (Suppl. material 1.6), including two hybrids (*Crataegus* × *media* Bechst. and *Narcissus* × *medioluteus* Mill.). Thirty-eight taxa are endemic to Italy, and only 16 are alien (*Aesculus hippocastanum* L., *Alnus cordata* (Loisel.) Duby, *Bromopsis inermis* (Leyss.) Holub subsp. *inermis*, *Cedrus atlantica* (Endl.) G.Manetti ex Carrière, *Erigeron annuus* (L.) Desf., *E. canadensis* L., *Euphorbia lathyris* L., *Isatis tinctoria* L. subsp. *tinctoria*, *Malus domestica* (Borkh.) Borkh., *Matricaria discoidea* DC. subsp. *discoidea*, *Oenothera glazioviana* Micheli, *Pseudotsuga menziesii* (Mirb.) Franco, *Rubus laciniatus* Weston, *Rumex patientia* L. subsp. *patientia*, *Symphoricarpos albus* (L.) S.F.Blake, and *Trifolium incarnatum* L. subsp. *incarnatum*). Thirty-eight taxa are included in the IUCN Red List of the Italian Flora (Rossi et al. 2013, Orsenigo et al. 2018). Twenty-four taxa have to be considered as floristic novelties, because either new or confirmed for the regional flora of Lazio or Abruzzo. The alien status of one taxon has been updated for Lazio.

In particular, the following 15 taxa are new for the flora of Lazio:

- *Bromopsis erecta* (Huds.) Fourr. subsp. *stenophylla* (Link) H.Scholz & Valdés
- *Festuca maritima* L.
- *Festuca stricta* Host subsp. *sulcata* (Hack.) Patzke ex Pils
- *Ficaria verna* Huds. subsp. *calthifolia* (Rchb.) Nyman
- *Hieracium glaucinum* Jord. subsp. *pseudobasalticum* Gottschl.
- *Hieracium pseudogrovesianum* Gottschl. subsp. *opertum* Gottschl.
- *Koeleria lucana* Brullo, Giusso & Miniss.
- *Orobanche amethystea* Thuill.
- *Pilosella corvigena* (Gottschl.) Gottschl.
- *Pilosella cymiflora* (Nägeli & Peter) S.Bräut. & Greuter
- *Pilosella ziziana* (Tausch) F.W.Schultz & Sch.Bip.
- *Plantago argentea* Chaix subsp. *argentea*
- *Potentilla neglecta* Baumg.
- *Pseudotsuga menziesii* (Mirb.) Franco
- *Trifolium lucanicum* Gasp. ex Guss.

The following six taxa are confirmed for the flora of Lazio:

- *Anthoxanthum nipponicum* Honda
- *Anthyllis vulneraria* L. subsp. *maura* (Beck) Maire
- *Luzula sylvatica* (Huds.) Gaudin subsp. *sieberi* (Tausch) K.Richt.
- *Orchis mascula* (L.) L. subsp. *speciosa* (Mutel) Hegi
- *Trisetaria flavescens* (L.) Baumg. subsp. *flavescens*
- *Vicia tenuifolia* Roth subsp. *tenuifolia*

The alien status in Lazio has been changed from CAS to NAT for:

- *Matricaria discoidea* DC. subsp. *discoidea*

The following two taxa are new for Abruzzo:

- *Adenocarpus complicatus* (L.) J.Gay subsp. *samniticus* (Brullo, De Marco & Siracusa) Peruzzi
- *Potentilla neglecta* Baumg.

The following species is confirmed for the flora of Abruzzo:

- *Ornithopus perpusillus* L.

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Supplementary material I

Supplementary data

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Data type: supplementary data

Explanation note: **1.** Participants to the field trip of the working group for Floristics, Systematics and Evolution of the Italian Botanical Society (15–18 June 2016).

2. Study area and sampling sites. **3.** Thermo-pluviometric diagram of Cittareale, representative meteorological station in Velino and Aterno valleys. **4.** List of sampling sites, with reference number, locality name with short description, altitude, main habitats, cartographic coordinates (WGS84 33T) and date of collection.

5. Public and private herbaria in which the collected exsiccata are kept. Acronyms of public herbaria follow Thiers (2018). **6.** Inventory of the taxa collected during the field trip held in 2016 (and some further investigations by organizers on 29 March 2016, 15 and 29 April 2016, 23 March 2017, 2–3 June 2017) in Velino and Aterno valleys (Lazio-Abruzzo, central Italy).

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