

## New Floristic Contributions to the Flora of Andalusia (Spain)

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### Research Article

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#### ABSTRACT

In this study the *F. New floristic* contributions to the flora of Andalusia (Spain). Andalusia region (southern Spain) is a rich territory in floristic diversity. Orography, the variability of the edaphology/litology and the geological history has led to a significant percentage of endemisms. This work contributes to the knowledge of the Andalusian flora providing three new provincial records: *Anemone coronaria* L. (for Cordoba province), *Centaurea depressa* M. Bieb. and *Soliva stolonifera* (Brot.) Loudon (for Jaen province).

### INTRODUCTION

Andalusia (Southern Spain) is considered the richest region of vascular plants in Spain. Around 3000 species were estimated to grow within this territory. More recently only in Eastern Andalusia (Almeria, Granada, Jaen and Malaga provinces) this amount increases up to 3724 species and subspecies. Orography, edaphology/litology and geological history allow this floristic richness. This territory encompasses two mountain ranges: Sierra Morena and the Baetic range. The former occupies a belt along the north and has largely acid soils, its highest summits lying about 1300 m above sea level (a. s. l.) [1-5]. The latter is a limestone formation with its highest point in the Iberian Peninsula (3479 m a. s. l.). Between them lies the Guadalquivir depression, used for agriculture in the main. The region varies widely in rainfall pattern due to its topography. Thus, there are sub-desert areas in the southeast, and heavy rain areas in the southwest. The extension of Andalusia is huge spanning around 8.7 • 10<sup>6</sup> ha. Thus, there still are unprospected areas that can harbour new species or genera to be described. The most representative finding is *Gadornia falukeyi* Güemes and Mota; an endemic monotypic genus from Almeria. *Rivasmartinezia cazorlana* Blanca, Cueto, Benavente and J. Fuentes must be also highlighted. It was described from *Sierras de Cazorla, Segura y Las Villas* Natural Park (Jaen province). More recently, *Linaria qartobensis* Blanca, Cueto, J. Fuentes, L. Sáez & R. Tarifa has been described from olive crops in the province of Cordoba. Hybrids daffodils are being also described in the last years from Andalusia [6-9].

Botanists are encouraged to describe and cite new taxa; thereby knowledge on the flora can be spatially and temporarily updated in books, scientific journals and online databases such as this work exhibits three new chorologic records at province level. The taxa involved are:

- (i) *Anemone coronaria* L.
- (ii) *Centaurea depressa* M. Bieb.
- (iii) *Soliva stolonifera* (Brot.) Loudon.

Allochthonous species -as *C. depressa* and *S. stolonifera*- could be favoured by the expected climatic conditions in the forthcoming decades. Thus, the current distribution of these species is of great interest to assess their trend according to the future changing climate.

*Anemone* L. is a genus that belongs to Ranunculaceae family. It includes perennial herbs with usually solitary flowers and only petaloid perianth segments. Most of the species find their optimum in the Eurosiberian region, whilst diversity decreases in the Mediterranean region. In the Iberian Peninsula, the most spread species within the Mediterranean area is *A. palmata* L. In such territory can be also found *A. coronaria* L very rare species but reaching W Asia. Its distribution encompasses Cadiz, Huelva and Malaga provinces in Spain and Estremadura in Portugal. Moreover, it grows in the Balearic Islands–Mallorca and Menorca– as well as other evidences such as other records and old herbarium vouchers are stated in Barcelona, Palencia and Zamora provinces this species has also been escaped from cultivation in some cases <sup>[10-14]</sup>.

*Centaurea* L. shows a great diversity in the Iberian Peninsula and the Balearic Islands with 94 species-136 taxa considering subspecies and varieties. *Centaurea depressa* M. Bieb. is an archeophyte natural from C and SW Asia. It grows on uncultivated cereal fields, roadsides, etc. This species is scattered in eastern continental Spain in the following provinces: Alicante, Albacete, Almeria, Burgos, Cordoba, Ciudad Real, Castellon de la Plana, Cuenca, Granada, Huesca, Malaga, Soria, Teruel, Toledo, Valencia, Valladolid and Zaragoza. In this territory *C. depressa* is either naturalized or adventitious <sup>[15,16]</sup>.

*Soliva stolonifera* (Brot.) Loudon belongs to Asteraceae family as the previous species. It is naturalized in SW Europe and it is native from South America. This small plant can be found growing in pavement cracks of the cities and villages. More rarely it is also found on pathways and pasturelands of clay soils. Its distribution in peninsular Spain spans to the southwest part including Badajoz, Caceres, Cadiz, Ciudad Real, Cordoba, Huelva, Malaga, Salamanca, Sevilla and Toledo provinces.

## METHODOLOGY

The study area is located in southern Spain, specifically in Andalusia region (Cordoba and Jaen provinces). Specimens of the three taxa were collected to be deposited in the *Herbario del Real Jardín Botánico de Córdoba* (COA). Here we provide the new locality, 1 km x 1 km UTM coordinates, altitude, ecology, data, collector name, code of the voucher and observations.

## RESULTS

Flora of Andalusia is being updated continuously from many botanists and naturalists who focus in this area. This work is a contribution to the knowledge of this flora, in which the distribution of the species is more accurate each time. Please find below the details of the three taxa recorded in this work *Anemone coronaria* L. Cordoba: Lucena, Sierra de Aras, 30SUG7038, 691 m, dense shrubland on well-developed terrain from limestones, 28.03.2018, López-Tirado, COA 58550.

The new locality of *A. coronaria* grows in 310 m<sup>2</sup>, in a dense shrubland alternated with scarce grass patches 7 km from the Sierras Subbéticas Natural Park. The most representative shrub species are *Retama sphaerocarpa* (L.) Boiss., *Phlomis purpurea* L., *Crataegus monogyna* Jacq. and *Santolina rosmarinifolia* subsp. *canescens* (Lag.) Nyman. This area seems to be harmed by a small forest fire; therefore, it is surrounded by a forest of *Quercus rotundifolia* Lam. in the main. On the other hand, the study area partially contacts with an olive crop, which could be the most significant threat to *A. coronaria*. This finding enlarges the current distribution of this rare species to the province of Cordoba.

*Centaurea depressa* M. Bieb., Fl. Taur.-Caucas. 2: 346 (1808), *C. rivasmateoi* Ladero in Anales Inst. Bot. Cavanilles 27: 87 (1970), *Cyanus depressus* (M. Bieb.) Soják in Čas. Nár. Mus., Odd. Přír. 140: 131 (1972), Jaén: Aldeaquemada, Arroyo del Cecillo, 30SVH7258, 856 m, degraded scrub with pasture next to a roadside in acid, terrain, 31.05.2018, López-Tirado, COA 58578.

One specimen of *C. depressa* has been found in a degraded formation of *Cistus ladanifer* L., *C. monspeliensis* L. and *Lavandula pedunculata* (Mill.) Cav. The main herbaceous plants belong to a Tuberarietea guttatae pasture, i.e., non-nitrophilous therophitic pastures in acid and poor soils. The surroundings are cultivated with cereals which are a suitable habitat for this species. This is the first record of *C. depressa* for the province of Jaen.

## DISCUSSION AND CONCLUSION

*Soliva stolonifera* (Brot.) Loudon, Ort. Brit. 364 (1830), *S. lusitanica* (Sprengel) Less., Syn. Gen. Comp. 268 (1832) *Gymnostyles stolonifera* (Brot.) Tutin, Bot. Journ. Linn. Soc. 70: 18 (1975), *Gymnostyles lusitanica* (Sprengel) Less., Syst. Veg. 3: 500 (1826), *Hippia stolonifera* Brot., Fl. Port. 373 (1804). Jaén: Vilches, Dehesa del Corcho, 30SVH5634, 543 m, subnitrophilous pasture on basic terrain in open holm oak *dehesa*, 03.05.2018, López-Tirado, COA 58579.

While sampling a *Bourgaeo humilis-Galactitum tomentosae* Rivas Goday community *S. stolonifera* was detected. In this community the most representative species is *Cynara humilis* L. *Soliva stolonifera* was in blossom and covered by other species at the time of collection. As the previous species, this is the first record of *S. stolonifera* for the province of Jaen as well as the easternmost locality in the Iberian Peninsula.

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