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Article

# A new combination in *Jasione* L. (Campanulaceae). Unveiling a cryptic species obscured by morphological stasis

## Unha nova combinación en *Jasione* L. (Campanulaceae). Desvelando unha especie críptica opacada pola estase morfolóxica

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## Abstract

A new combination at the species level is proposed for a taxon endemic to the Prades mountains (Tarragona, northeastern Iberian Peninsula) previously classified as a variety of *Jasione crispa* (Pour.) Samp. The taxonomic update is based on phylogenetic delimitation results previously published by two of the authors of this work. Clarifying the taxonomic status of this taxon is relevant as the new species is identified as highly endangered. Thus, its conservation status is assessed as Critically Endangered (IUCN), with an extent of occurrence of 4 km$^2$ and fewer than 40 mature individuals, making the adoption of conservation measures necessary.

**Keywords:** Conservation Status; Iberian flora; endemism; Critically Endangered; phylogenetic delimitation.

## Resumo

Proponse unha nova combinación no nivel específico para un taxon endémico das montañas de Prades (Tarragona, noroeste da península ibérica) clasificado previamente como unha variedade de *Jasione crispa* (Pour.) Samp. A actualización taxonómica baséase en resultados de delimitación filoxenética previamente publicados por dous dos autores deste traballo. Clarificar o status taxonómico deste taxon é relevante dado que a nova especie estaría fortemente ameazada. Así, o seu estado de conservación é avaliado como Criticamente Ameazado (CR, UICN), cunha extensión de presenza de 4 km$^2$ e menos de 40 individuos maduros, sendo preciso adoptar medias de conservación.

**Palabras chave:** Estado de conservación; flora ibérica; endemismo; Criticamente Ameazado; delimitación filoxenética.

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## INTRODUCTION

The causes of the morphological stasis that is intrinsic to some biological groups have long been intriguing to researchers (STANLEY, 1975; FIŠER *et al.*, 2018), a pattern whose underlying evolutionary mechanisms remain poorly understood (MONRO & MAYO, 2022). Regardless of the causes of the pattern, the likely result is the existence of high levels of cryptic diversity that are not recognised by traditional morphologically-based taxonomic approaches. The genus *Jasione* L., belonging to the family Campanulaceae, shows a high degree of morphological homogeneity, which has led to conflicting taxonomic treatments and the suggestion that the potential diversity has not been considered in these treatments (SERRANO *et al.*, 2024).

In the framework of recent phylogenetic and systematic research on the genus *Jasione*, an integrative approach identified the need to revise the species delimitation in the *Jasione sessiliflora* Boiss. & Reut. and *J. crispa* (Pour.) Samp. aggregates in the Iberian Peninsula (SERRANO & ORTIZ, 2023). It was also noted that some populations that merit taxonomic recognition at species level may be seriously threatened, and updating its nomenclature is a necessary first step towards conservation actions. This particularly applies to a small population restricted to the Prades mountains (in the province of Tarragona, NE Iberian Peninsula), originally described as *J. crispa* var. *praelittoralis* Masclans (MASCLANS & BATALLA, 1972). This plant (Fig. 1) was recently identified as a diploid (2n=12) representing an independent lineage, and different phylogenetic methods used to delimit species suggested that it should be considered a new species (SERRANO & ORTIZ, 2023). The taxonomic relationships in this taxon, which has been subordinated, related or synonymized first to *J. crispa* and later to *J. sessiliflora* (MASCLANS & BATALLA, 1972; BOLÒS & VIGO, 1996; SALES & HEDGE, 2001a; SÁEZ *et al.*, 2010) have remained uncertain until recent times. The *Jasione crispa* complex was considered to occur in southern France, the Iberian Peninsula, and northwestern Africa, encompassing four ploidy levels and a number of described taxa of difficult morphological characterization and generally not supported by differences in ploidy (DOBIGNARD, 1977; KÜPFER, 1981). This complexity has led to the adoption of conflicting systematic treatments among the different authors who have addressed the complex throughout history (WILLKOMM & LANGE, 1868; SCHMEJA, 1931; TUTIN, 1973; SALES & HEDGE, 2001b). Recent studies have begun to define the relationships between taxa in the group and to identify those with taxonomic validity through phylogenetic delimitation and support from ploidy information, finding up to five levels of ploidy in the *J. crispa* complex, which would form a clade endemic to southwestern Europe (SERRANO, 2021).

**Figure 1. *Jasione praelittoralis* in its natural habitat in Prades mountains, Tarragona.**

According to SERRANO & ORTIZ (2023), in addition to phylogenetic delimitation, a combination of subtle morphological traits (average hydathoid number, leaf epidermal cell



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sizes and hair width) and ploidy level enabled identification of *J. crispa* var. *praelittoralis* as a species different from the tetraploid *J. sessiliflora* (2n=24). These morphological features also differentiate the new taxon from other diploids in the polyploid complex, such as *J. crispa* subsp. *mariana* (Willk.) Rivas Mart. and *J. crispa* subsp. *tomentosa* (A.DC.) Rivas Mart. Overall, the integrative phylogenetic approach of SERRANO & ORTIZ (2023) suggests three main groups of lineages within the *J. sessiliflora* group. The first group includes the tetraploid populations of typical *J. sessiliflora*, some tetraploid populations of the western Central System previously assigned to *J. crispa* subsp. *crispa* (SALES & HEDGE, 2001b), tetraploid populations with intermediate characters between *J. sessiliflora* and *J. crispa* subsp. *tomentosa*, and the tetraploid subspecies *J. crispa* subsp. *segurensis* Mota, C. Díaz, Gómez-Merc. & F. Valle. The second group includes most diploid populations and consists of *J. crispa* subsp. *tomentosa*, *J. crispa* subsp. *mariana*, and *J. sessiliflora* subsp. *appressifolia* (Pau) M.B. Crespo & Mateo. The third group, consisting only of the Prades Mountain population, referred to as *J. crispa* subsp. *praelittoralis*, was recognised in a sister position to all other lineages. A fourth lineage was included in the analyses to represent *J. crispa* s. str., being identified as a different and evolutionarily significant unit (ESU) with hexaploid (2n=36) ploidy level (SERRANO & ORTIZ, 2023). Therefore, the Prades population would represent a relatively isolated ESU that has gone unnoticed within its group due to the strong morphological stasis that characterises the genus *Jasione*. The taxonomic rank of this taxon must be updated and attention given to it in relation to conservation.

## MATERIAL AND METHODS

The taxonomical updating was conducted in accordance with TURLAND *et al*. (2025), and based on the results of the phylogenetic delimitation study of SERRANO & ORTIZ (2023). The extent of occurrence and area of occupancy were calculated using the GeoCAT tool BACHMAN *et al*., 2011).

## RESULTS AND DISCUSSION

Considering the available information regarding the phylogenetic relationships, ploidy level, biogeography and morphology of *Jasione crispa* var. *praelittoralis*, we propose recognition of this taxon at species level, to better reflect its relationships with the rest of the Iberian species.

*Jasione praelittoralis* (Masclans) M. Serrano, S. Ortiz & L. Sáez, comb. nov.

Basionym:

*Jasione crispa* var. *praelittoralis* Masclans in Collect. Bot. (Barcelona) 8: 124 (1972).

Holotype: SPAIN, province of Tarragona, Muntanyes de Prades, Vall de Castellfollit, Si [siliceous], 1000 m alt.., pineda de *Pinus sylvestris* 28 June 1954, F. Masclans (BC 601633!) (Fig. 2).

**Figure 2. Holotype of *Jasione praelittoralis* (BC 601633).**

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Conservation status: *J. praelittoralis* is currently known from the Castellfollit valley (Tarragona province, Catalonia, Spain), where it grows in clearings in a *Pinus sylvestris* L. forest, on siliceous soil, in a narrow altitudinal zone between 1020 and 1070 m.a.s.l. The species only occurs in a single locality in which two small stands of hundreds of square meters are known; no more than 40 mature individuals exist. The extent of occurrence and area of occupancy, according to IUCN 2012, is 4 $km^2$, and the population size is small enough to make this species vulnerable even to natural events, such as fires, droughts, and changes in vegetation cover. Our data so far indicate that *J. praelittoralis* should be assessed as "Critically Endangered" CR D, following the categories and criteria of IUCN (2012).

Given the extreme fragility of its population, we suggest that the species be included in the various protection catalogs operating within the species' territorial range. Urgent conservation measures should be adopted for the species, both *ex situ* and *in situ*, and its population status should be monitored, including its genetic diversity, in accordance with the guidelines of the United Nations' Convention of Biological Diversity Kunming-Montreal Global Biodiversity Framework (CBD, 2022).

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## REFERENCES

BACHMAN, S., MOAT, J.A. HILL, W., TORRE, J., SCOTT, B. (2011). Supporting Red List threat assessments with GeoCAT: geospatial conservation assessment tool. *ZooKeys*, 150: 117–126.

BOLÒS, O & VIGO, J. (1996). *Flora dels Països Catalans* 3. Ed. Barcino. Barcelona. 1230 pp.

FIŠER, C., ROBINSON, C.T., MALARD, F. (2018). Cryptic species as a window into the paradigm shift of the species concept. *Molecular Ecology*, 27: 613–635.

CBD. (2022) *Decision adopted by the Conference of the Parties to the Convention on Biological Diversity CBD/COP/DEC/15/4 Kunming-Montreal Global Biodiversity Framework*. CBD/COP/DEC/15/4.

IUCN (2012). IUCN Red List categories and criteria: version 3.1, ed. 2. Gland & Cambridge: IUCN.

DOBIGNARD, A. (1977). Nouvelles observations sur la flore du Maroc. *Candollea*, 52: 119–157.

MASCLANS, F. & BATALLA. E. (1972). Flora de los Montes de Prades. *Collectanea Botanica (Barcelona)*, 8: 63-200.

MONRO, A. K., & MAYO, S. J. (Eds.). (2022). *Cryptic species. Morphological stasis, circumscription, and hidden diversity*. Cambridge University Press. Cambridge. 350 pp.

SÁEZ, L., AYMERICH, P. & BLANCHÉ, C. (2010). *Llibre Vermell de les plantes vasculars endèmiques i amenaçades de Catalunya*. Argania Editio. Barcelona. 811 pp.

SALES, F. & HEDGE, I.C. (2001a). *Jasione* L. *In*: Paiva, J., Sales, F., Hedge, I. C., Aedo, C., Aldasoro, J. J., Castroviejo, S., Herrero, A. & Velayos, M. (Eds.), *Flora Iberica* 14: 153–170. Real Jardín Botánico, Madrid.

SALES, F. & HEDGE, I.C. (2001b). Notulae taxonomicae, chorologicae, nomenclaturales, bibliographicae aut philologicae in opus “Flora Iberica” intendentes. *Anales del Jardín Botánico de Madrid*, 59: 163–172.

SCHMEJA, O. (1931). Beitrage zur Kenntnis der Gattung *Jasione. Beihefte zum botanischen Centralblatt* 48: 1-51.

SERRANO, M. (2021). *Jasione L. (Campanulaceae): Biogeographic history, evolutionary relationships, species delimitation, and nomenclatural revision* [Doctoral dissertation, University of Santiago de Compostela]. USC Repository. http://hdl.handle.net/10347/27259

SERRANO, M., DIMITROVA, L., & ORTIZ, S. (2024). Nomenclature and typification of the *Jasione* L. (Campanulaceae) groups from the eastern Mediterranean basin. *Plants*, 13 (1), 50.

SERRANO, M. & ORTIZ, S. (2023) Species delimitation in a polyploid group of Iberian *Jasione* (Campanulaceae) unveils coherence between cryptic speciation and biogeographical regionalization. *Plants* 12 (24), 4176.

STANLEY, S. M. (1975). A theory of evolution above the species level. *Proceedings of the National Academy of Sciences of the United States of America*, *72* (2): 646–650.

TURLAND, N. J., WIERSEMA, J. H., BARRIE, F. R., GANDHI, K. N., GRAVENDYCK, J., GREUTER, W., HAWKSWORTH, D. L., HERENDEEN, P. S., KLOPPER, R. R., KNAPP, S., KUSBER, W.-H., LI, D.-Z., MAY, T. W., MONRO, A. M., PRADO, J., & al. (Eds.). (2025). *International Code of Nomenclature for algae, fungi, and plants (Madrid Code)* (18th ed., *Regnum Vegetabile* No. 162). University of Chicago Press. 288 pp.

TUTIN, T.G. (1973). Notes on *Jasione* L. in Europe. *Botanical Journal of the Linnean Society*, 67: 276-283.

WILLKOMM, M & LANGE, J. (1868). *Prodromus florae Hispaniae* Vol. 3. Stuttgart, Germany. 1144 pp.



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