Received: 23 November 2020 | Revised: 11 May 2021 | Accepted: 24 June 2021

DOI: 10.1111/geb.13363

DATA ARTICLE

Global Ecology and Biogeography A Journal of Macroecology WILEY

Atlas of the vascular flora of the Iberian Peninsula biodiversity hotspot (AFLIBER)

Ignacio Ramos-Gutiérrez[1,2] | Herlander Lima[3] | Santiago Pajarón[4] | Carlos Romero-Zarco[5] | Llorenç Sáez[6] | Luciano Pataro[1] | Rafael Molina-Venegas[3] | Miguel Á. Rodríguez[3] | Juan Carlos Moreno-Saiz[1,2]

[1]Department of Biology (Botany), Universidad Autónoma de Madrid, Madrid, Spain

[2]Research Center on Biodiversity and Global Change (CIBC-UAM), Universidad Autónoma de Madrid, Madrid, Spain

[3]GloCEE – Global Change Ecology & Evolution Group, Department of Life Sciences, University of Alcalá, Alcalá de Henares, Spain

[4]Departamento de Biodiversidad, Universidad Complutense de Madrid, Madrid, Spain

[5]Departamento de Biología Vegetal y Ecología, Universidad de Sevilla, Sevilla, Spain

[6]Departament of Animal Biology, Plant Biology and Ecology, Universitat Autònoma de Barcelona, Bellaterra, Spain

Correspondence

Ignacio Ramos-Gutiérrez, Department of Biology (Botany), Universidad Autónoma de Madrid, 28049, Madrid, Spain.
Email: ignacio.ramosgutierrez@uam.es

Funding information

Ministerio de Economía, Industria y Competitividad, Gobierno de España, Grant/Award Number: CGL2017-86926-P

Editor: Jonathan Lenoir

Abstract

Motivation: We accessed published and unpublished floristic sources to compile a comprehensive species list of the Iberian–Balearic terrestrial vascular flora and generate AFLIBER, an accurate floristic database of georeferenced plant occurrence records.

Main type of variable contained: Species distribution data totalling 1,824,549 plant occurrence records corresponding to 6,456 species and subspecies.

Spatial location and grain: The western Mediterranean, including inland territories of Spain, Portugal and Andorra and the adjacent archipelagos of Berlengas, Columbretes and the Balearic Islands, covered by 6,316 UTM quadrangular grid cells of 10 km resolution.

Time period: All distributional trustable records were considered to create the AFLIBER database, most of them dating from the 1960s onwards.

Major taxa and level of measurement: Terrestrial vascular plant species and subspecies.

Software format: Data are supplied as comma-separated text (csv) files.

KEYWORDS

Balearic Islands, biodiversity hotspot, geographical distribution, Portugal, Spain, vascular plants

1 | INTRODUCTION

With nearly 6,500 native vascular plant species and subspecies, of which 28% are endemics (Buira et al., 2017), the Iberian Peninsula (western Mediterranean) and its eastern Baetic offshore prolongation (the Balearic archipelago; Sàbat et al., 2011) comprise about one-quarter of the total vascular taxa of the Mediterranean basin (*c.* 25,000 species), the world's third-richest plant biodiversity hotspot (Fady & Concord, 2010; Myers et al., 2000). This outstanding plant diversity prompted the *Flora iberica* (FI) project in the mid-1980s, a long-lasting initiative aimed at synthesizing the knowledge of systematic botany of the Iberian–Balearic region. Since then, 22 volumes have been published describing *c*. 5,600 species and subspecies (Castroviejo, 1986–2019), providing valuable information on whether a taxon is endemic to the region and in which administrative provinces it occurs. Yet, FI is still a work in progress for two main reasons. First, the last two volumes devoted to the grass family Poaceae (*c*. 500 taxa in the region) are still underway. Second, there is a continuous publication of new plant occurrences and revisions of taxonomical treatments based on both classical and molecular systematics. Consequently, FI also tackles new botanical publications to collate newly described taxa and plant occurrences on its website (http://www.floraiberica.es).

Besides, the Spanish plant information system, Anthos (http://www.anthos.es/), was created soon after the FI project to host floristic occurrences, and it currently comprises *c*. 2 million plant records georeferenced according to the standard European UTM grid at 10 km resolution. A similar structure has been used for the equivalent database of Portugal, Flora.On (https://flora-on.pt), and many subnational biodiversity databases, atlases and/or red books on plant distributions across this region (e.g., Bañares et al., 2004; Villar et al., 1997–2001). Importantly, all plant records included in Anthos, plus *c*. 13 million extra records from other databases, have been uploaded to the Global Biodiversity Information Facility (GBIF; https://www.gbif.org/), the largest source of Iberian plant distributional data hitherto.

Although we acknowledge the extraordinary value of open-access biodiversity repositories, it should be noted that some records are often duplicated, imprecise or of dubious nature (Gaiji et al., 2013). Also, many records remain hardly accessible in non-digitized bibliographical sources (e.g., data from red books or floristic atlases) and restricted regional electronic repositories. Moreover, floristic information is often dated and riddled with errors (Anderson et al., 2016; Maldonado et al., 2015), which might have hampered fine-grained plant macroecological studies in the western Mediterranean. For instance, inflated omission error rates often force spatial analyses to be conducted at coarse grains (e.g., Buira et al., 2017; Lobo et al., 2001; Moreno-Saiz et al., 2013) that might not be appropriate to inform conservation planning and policy-making.

In this data paper, we provide AFLIBER, a comprehensive database connecting the up-to-date species list of the Iberian–Balearic vascular native flora with its matching occurrence records rescaled to a standard UTM 10 km grain resolution. The outstanding characteristics of this database are threefold: (1) it has been generated according to the latest knowledge in floristics and taxonomy published for the region; (2) it has reduced geographical biases by incorporating both subregional databases broadly absent from previous wide-ranging repositories and distributional information published in monographs, grey literature and floristic articles; and (3) it provides occurrence records that were filtered conservatively to minimize identification and georeferencing errors (see Methods) by means of a combined automatic and manual protocol undertaken by professional botanists specialized in the Iberian flora. Thus, this dataset represents an unprecedented effort to support botanical, biogeographical and macroecological studies in the western Mediterranean by providing comprehensive and carefully curated plant distributional information across the Iberian Peninsula.

2 | METHODS

The study area includes the Iberian Peninsula (mainland Portugal, Spain and Andorra) and the adjacent archipelagos of Berlengas (0.99 km^2), Columbretes (0.19 km^2) and the Balearic Islands (4,992 km^2), altogether comprising 6,316 terrestrial 10-km-side UTM grid cells (see Supporting Information Figure S2.1 in Supplement 2).

2.1 | Data compilation

First, we compiled all native vascular plant species and subspecies included in the published volumes of FI (Castroviejo, 1986–2019). Species in the Poaceae family (unpublished volumes) were obtained from different sources, including a comprehensive monograph by Romero-Zarco (2015), generic treatments published in recent years (see supplementary bibliography in Supporting Information Supplement 4a) and personal communications from experts involved in the preparation of the FI Poaceae volumes (i.e., C. Acedo, personal communication; J.A. Devesa, personal communication). Second, we conducted an exhaustive literature review to retrieve all newly published taxa (until July 2020) that were missing in the previous sources. Specifically, we revised the “new taxa” tab of the FI website (www.floraiberica.es/miscelania/nuevos_taxones.php), updated generic monographies and articles with newly recorded or described species in the study area (see Supporting Information Supplement 4a: Supplementary References). Taxa were considered endemic whenever their distribution was limited to the study area, including the northern slope of the Pyrenees (border with France), thus following previous biogeographical accounts of the Iberian flora (e.g., Buira et al., 2021; Moreno-Saiz & Sainz Ollero, 1992).

All distributional information at 10 km resolution was retrieved from high-quality, trustable databases available from electronic repositories and published research papers (Supporting Information Supplement 4b), including an unpublished database that was carried out over 30 years of data compilation from non-digitized sources (IberBal-Flora; see Supporting Information Supplement 4b). In order to complement the survey, GBIF plant occurrence records with a minimum resolution of 10 km were imported using the “rgbif” R package (Chamberlain et al., 2019). It is important to note that GBIF includes large numbers of unverified records that do not reflect the native distribution of species (e.g., corresponding to *ex situ* cultivation, botanical gardens). Thus, in order to tease apart doubtful and/or potentially erroneous information conservatively, we filtered GBIF records to include only those georeferenced within the limits of the administrative provinces of Spain, Portugal and Andorra where the species occur according to FI and other later reliable publications. Clearly outlying observations were removed using the *over* function of the "sp" R package (Pebesma & Bivand, 2005). References on occurrence records retrieved from GBIF are shown in the Supporting Information (Supplement 4c). Furthermore, the resultant distributional maps were explored visually one by one by the professional botanists of the team (i.e., C.R.Z., I.R.G., J.C.M.S., L.S. and S.P.) in search for erroneous or doubtful occurrences and to amend potential information gaps manually on the basis of expert knowledge of the study region (Figure 1). A list including 29,600 disregarded records is provided in the Supporting Information (Supporting Information Table S3.3 in Supplement 3).

2.2 | Analysis of completeness

We used the nonparametric Chao2 estimator (Colwell & Coddington, 1994) to detect unequally sampled areas across the territory. To do so, the study area was divided into administrative provinces, following the FI scheme (Supporting Information Figure S2.2 in Supplement 2). Each province containing fewer than fifty 10 km grid cells was merged with its nearest neighbouring one to avoid extremely distinct sizes among them, making a total of 56 provinces (ranging from 4,500 to 21,700 km^2). The analysis was performed within provinces and for the complete territory as a single unit, using the *specpool* function as implemented in the "vegan" R package (Oksanen et al., 2019).

3 | RESULTS

3.1 | Species list and distribution data

A total of 6,456 native species and subspecies were compiled (5,681 species after collapsing subspecies), of which 2,142 are endemic to the study area (Table 1a). We gathered a total of 2,716,018 distributional records (Table 1b; Figure 2a) comprising 1,824,549 unique (i.e., non-duplicated) occurrences at the 10-km-side grid-cell resolution (Figure 2b). Plant occurrences were distributed across 6,303 grid cells (99.8% of total cells), of which 6,177 included species that are endemic to the study area (97.8% of the total; Figure 2c). Empty cells (0.2%) generally corresponded to coastal cells, only covering inland area in part, or to areas located between UTM transition zones.

3.2 | Database completeness

Floristic completeness for the entire study area was strikingly high (98.57%), suggesting that the flora in the Iberian Peninsula is already well known and well represented in our database. Indeed, when investigated separately throughout administrative provinces, completeness estimates remained high overall, with values ranging between 85 and 96% (cf. Figure 2d).

4 | DISCUSSION

The outstanding plant diversity and geographical extension of the Iberian Peninsula within the Mediterranean basin hotspot makes it an ideal setting to advance our understanding of the Mediterranean flora (Nieto Feliner, 2014), which has been greatly hampered by the lack of a comprehensive source of regional plant distribution. Given its size and exhaustive data curation, the AFLIBER database represents a major step towards filling in this central gap of floristic and distributional knowledge in the western Mediterranean, having the potential to become the new Iberian reference for future plant macroecological, biogeographical and conservation studies. Indeed, with

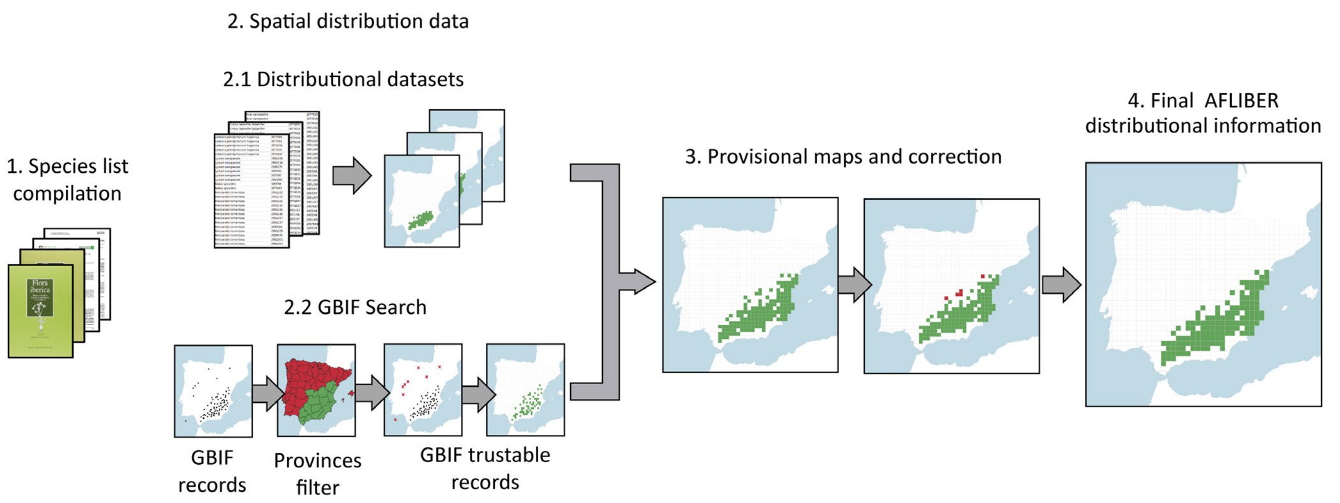

FIGURE 1 Workflow for creation of AFLIBER. (1) We compiled all species described in *Flora iberica* (FI) and later monographs and publications. (2) For each species in the list, we retrieved spatial distribution data in 10 km UTM cells, following a twofold procedure: (2.1) we retrieved information from reliable datasets (see Supporting Information Supplement 4b); and (2.2) the GBIF occurrence records were imported, disregarding occurrences with low coordinate resolution or that mapped away from the known distribution of the species (provinces filter). (3) These data were plotted as provisional maps that were visually explored and corrected by experts to achieve (4) the final result

TABLE 1 Data files variable names and description (data can be found on Dryad at: https://doi.org/10.5061/dryad.gmsbcc2kv)

Variable	Definition
(a) AFLIBER_Species_list.csv	
Taxon	Genus, species and subspecies (if applicable) epithets
Scientific_Name	Accepted scientific name
Endemic	Endemism of the Balearic Islands and/or the Iberian Peninsula (including French northern Pyrenean slope)
Genus	Adopted taxonomical category
Species	Adopted taxonomical category
Subspecies	Adopted taxonomical category
Class	Taxonomical category according to the National Center for Biotechnology Information (www.ncbi.nlm.nih.gov/guide/taxonomy/)
Order	Taxonomical category (according to NCBI)
Family	Taxonomical category (according to NCBI)
GBIF_id	Taxonomic numerical identifier in the Global Biodiversity Information Facility (https://www.gbif.org/)
POW_Name	Accepted taxonomic name in *Plants of the World online* (www.plantsoftheworldonline.org)
(b) AFLIBER_Distributions.csv	
Taxon	Genus, species and subspecies (if applicable) epithets
UTM.cell	UTM 10-km-side grid cell where the taxon is recorded
References	Sources from which the occurrence data were obtained. Numerical references correspond to those shown in the Supporting Information (Supplement 4b)

its 6,456 species and subspecies, this database not only approaches the 6,500 taxa estimated by Buira et al., (2017), but also elevates the number of endemic Iberian taxa to 2,142 species and subspecies. These numbers posit a higher figure than earlier accounts of Iberian plant diversity (Buira et al., 2017, 2020; Sainz-Ollero & Moreno-Saiz, 2002), representing an increase in endemics above 30% and thus equalling Iberian plant endemicity level to that of the Anatolian Peninsula in the Eastern Mediterranean (Davis et al., 1988). Interestingly, this pattern is much in line with earlier studies that recognized both ends of the Mediterranean basin as major centres of plant endemism (Médail & Quézel, 1997).

It is important to note that, despite all the efforts to detect mistakes and misidentifications, the AFLIBER database might include some erroneous records and taxonomic treatments that are still subject to debate. Yet, bearing in mind that our knowledge of the Iberian flora remains incomplete, AFLIBER is certainly the most exhaustive and refined Iberian plant database published hitherto, representing a major improvement over other popular repositories of distributional information widely used in the past. For instance, the latest update of Anthos, the main source of reference for Iberian plant distribution so far, dates back to 2016 (L. Medina, personal communication).

Although floristic completeness across the study area was acceptable (see Figure 2d), we note that some territories have been less prospected (Figure 2a) or lack distributional information in standard UTM grid cells (i.e., atlases), particularly towards western and southern areas. Such gaps of floristic knowledge might lead to unbalanced accounts of distributional information, which could be addressed both by future prospection conducted in poorly sampled areas and by georeferencing extant information treasured in herbaria. Nevertheless, distinct levels of plant diversity across Iberian territories might also respond to natural processes. For example, plant species richness peaked in mountainous regions (see Figure 2b; Castro-Parga et al., 1996; Lobo et al., 2001), whereas human modification of natural ecosystems has led to depauperated levels of diversity over the centuries in certain areas, such as inner depressions and fertile river basins. A similar pattern can be observed for endemic species, which are particularly abundant in mountain regions, such as the Pyrenees, the Cantabrian range and, especially, in the Sierra Nevada (Baetic range), the hottest spot of floristic diversity in the Mediterranean (Blanca et al., 1998; Buira et al., 2021; Heywood, 2003).

The essence of the AFLIBER database lies in taxonomic botany, a discipline that is slowly disappearing from academic curricula (Crisci et al., 2020). This ongoing crisis in botany is attributable, in part, to the bibliometrics that are used to judge the impact of scientific research, which often undermine plant taxonomy despite it being the basis of many downstream disciplines, such as ecology, biogeography and conservation biology (Crisci et al., 2020; Woodland, 2007). Nonetheless, professional and amateur Iberian botanists continue to generate priceless floristic and taxonomic data, and the recently constituted Spanish Botanical Society will take up the challenge of maintaining taxonomic botany alive as a foundational task, including data curation of the

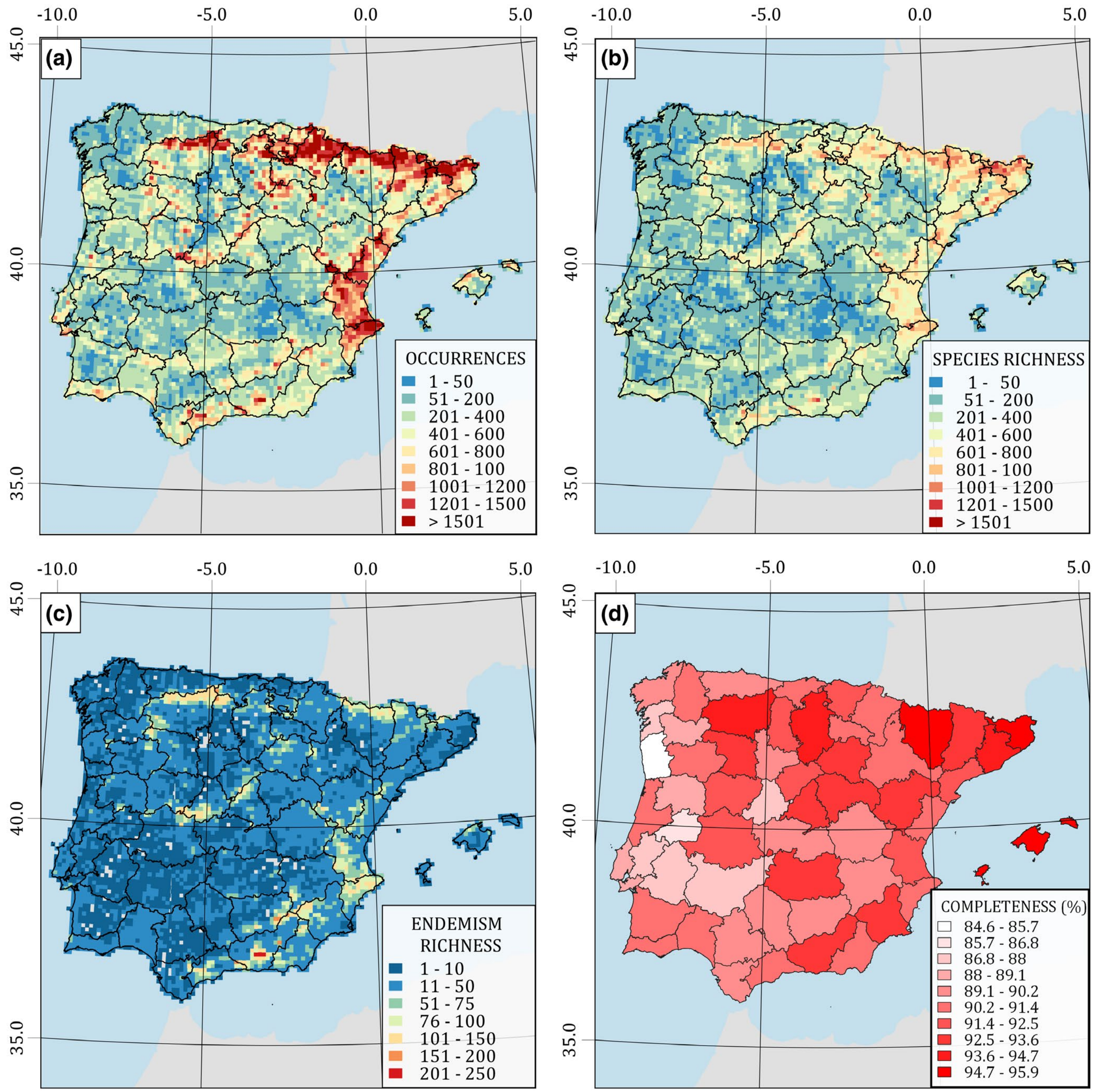

FIGURE 2 AFLIBER database number of (a) occurrences; (b) species richness (i.e., non-duplicated occurrences); (c) endemic species richness per 10 km UTM cell; and (d) percentage of regional floristic completeness

AFLIBER database and the incorporation of the two last volumes of *Flora iberica* (Poaceae) and other relevant essays in due course.

ACKNOWLEDGMENTS

We thank data curators who granted access to the restricted databases listed in the Supporting Information (Supplement 4b). We are also grateful to the many colleagues who revised the taxonomic treatment of some genera and contributed unpublished distributional data, especially Pedro Jiménez-Mejías, Carmen Acedo, Santiago Martín-Bravo and Juan Devesa. This work was funded by the Spanish Ministry of Science, Innovation and Universities through the Bioregions 2.0 project (CGL2017-86926-P) granted to M.A.R. and J.C.M.S. I.R.G. was supported by the Garantía Juvenil program (PEJ-2018-AI/AMB-9865) and R.M.-V. by the TALENTO program (2018-T2/AMB-10332), both from the Government of the Community of Madrid.

AUTHOR CONTRIBUTIONS

M.A.R., R.M.-V. and J.C.M.S. conceived the research; I.R.G., H.L., S.P., L.P., C.R.Z., L.S. and J.C.M.S. contributed to the dataset; I.R.G., S.P., C.R.Z., L.S. and J.C.M.S. revised and cleaned data; I.R.G. conducted analyses and drew the figures; R.M.-V., I.R.G. and J.C.M.S. led the writing with help from all the authors.

DATA AVAILABILITY STATEMENT

AFLIBER_Species_list.csv and AFLIBER_Distributions.csv data files are supplied as shown in Table 1 at Dryad Digital Repository (https://doi.org/10.5061/dryad.gmsbcc2kv). Updates on taxonomic and chorological information will be published at the AFLIBER database website: https://iramosgutierrez.github.io/afliber

ORCID

Ignacio Ramos-Gutiérrez https://orcid.org/0000-0002-8675-0114
Santiago Pajarón https://orcid.org/0000-0003-2499-9341
Carlos Romero-Zarco https://orcid.org/0000-0003-4178-2419
Llorenç Sáez https://orcid.org/0000-0003-4551-2432
Rafael Molina-Venegas https://orcid.org/0000-0001-5801-0736
Miguel Á. Rodríguez https://orcid.org/0000-0002-4082-2995
Juan Carlos Moreno-Saiz https://orcid.org/0000-0002-0793-9956

REFERENCES

Anderson, R. P., Araujo, M., Guisan, A., Lobo, J. M., Martinez-Meyer, E., Townsend, A., & Soberon, J. (2016). Are species occurrence data in global online repositories fit for modelling species distributions? In *The case of the Global Biodiversity Information Facility (GBIF), 2016; Final report of the task group on GBIF data fitness for use in distribution modelling*. Global Biodiversity Information Facility. https://www.gbif.org/es/document/82612/report-of-the-task-group-on-gbif-data-fitness-for-use-in-distribution-modelling

Bañares, A., G. Blanca, J. Güemes, J. C. Moreno, & S. Ortiz (Eds.) (2004). *Atlas y Libro Rojo de la Flora Vascular Amenazada de España*. Dirección General de Conservación de la Naturaleza.

Blanca, G., Cueto, M., Martínez-Lirola, M. J., & Molero-Mesa, J. (1998). Threatened vascular flora of Sierra Nevada (Southern Spain). *Biological Conservation*, *85*, 269–285. https://doi.org/10.1016/S0006-3207(97)00169-9

Buira, A., Aedo, C., & Medina, L. (2017). Spatial patterns of the Iberian and Balearic endemic vascular flora. *Biodiversity and Conservation*, *26*, 479–508. https://doi.org/10.1007/s10531-016-1254-z

Buira, A., Cabezas, F., & Aedo, C. (2020). Disentangling ecological traits related to plant endemism, rarity and conservation status in the Iberian Peninsula. *Biodiversity and Conservation*, *29*, 1937–1958. https://doi.org/10.1007/s10531-020-01957-z

Buira, A., Fernández-Mazuecos, M., Aedo, C., & Molina-Venegas, R. (2021). The contribution of the edaphic factor as a driver of recent plant diversification in a Mediterranean biodiversity hotspot. *Journal of Ecology*, *109*, 987–999. https://doi.org/10.1111/1365-2745.13527

Castro-Parga, I., Moreno-Saiz, J. C., Humphries, C. J., & Williams, P. H. (1996). Strengthening the Natural and National Park system of Iberia to conserve vascular plants. *Botanical Journal of the Linnean Society*, *121*, 189–206. https://doi.org/10.1111/j.1095-8339.1996.tb00753.x

Castroviejo, S., coord. (1986–2019). *Flora iberica* 1-18, 20-21. Real Jardín Botánico, CSIC.

Chamberlain, S., Barve, V., Desmet, P., Geffert, L., Mcglinn, D., Oldoni, D., & Karthik, R (2019). *rgbif: Interface to the Global 'Biodiversity' Information Facility API*. R package version 1.3.0. https://CRAN.R-project.org/package=rgbif

Colwell, R. K., & Coddington, J. A. (1994). Estimating terrestrial biodiversity through extrapolation. *Philosophical Transactions of the Royal Society B: Biological Sciences*, *345*, 101–118.

Crisci, J. V., Katinas, L., Apodaca, M. J., & Hoch, P. C. (2020). The end of botany. *Trends in Plant Science*, *25*, 1173–1176. https://doi.org/10.1016/j.tplants.2020.09.012

Davis, P. H., Mill, R. R., & Tan, K. (1988). *Flora of Turkey and the East Aegean Islands*, 10. Edinburgh University Press.

Fady, B., & Concord, C. (2010). Macroecological patterns of species and genetic diversity in vascular plants of the Mediterranean basin. *Diversity and Distributions*, *16*, 53–64. https://doi.org/10.1111/j.1472-4642.2009.00621.x

Gaiji, S., Chavan, V., Ariño, A. H., Otegui, J., Hobern, D., Sood, R., & Robles, E. (2013). Content assessment of the primary biodiversity data published through GBIF network: Status, challenges and potentials. *Biodiversity Informatics*, *8*, 94–172.

Heywood, V. H. (2003). The jewel in the crown. *Plant Talk*, *32*, 42–43.

Lobo, J. M., Castro, I., & Moreno, J. C. (2001). Spatial and environmental determinants of vascular plant species richness distribution in the Iberian Peninsula and Balearic Islands. *Biological Journal of the Linnean Society*, *73*, 233–253. https://doi.org/10.1111/j.1095-8312.2001.tb01360.x

Maldonado, C., Molina, C. I., Zizka, A., Persson, C., Taylor, C. M., Albán, J., Chilquillo, E., Rønsted, N., & Antonelli, A. (2015). Estimating species diversity and distribution in the era of big data: to what extent can we trust public databases? *Global Ecology and Biogeography*, *24*, 973–984.

Médail, F., & Quézel, P. (1997). Hot-spots analysis for conservation of plant biodiversity in the Mediterranean Basin. *Annals of the Missouri Botanical Garden*, *84*, 112–127. https://doi.org/10.2307/2399957

Moreno-Saiz, J. C., Donato, M., Katinas, L., Crisci, J. V., & Posadas, P. (2013). New insights into the biogeography of south-western Europe: Spatial patterns from vascular plants using cluster analysis and parsimony. *Journal of Biogeography*, *40*, 90–104. https://doi.org/10.1111/j.1365-2699.2012.02774.x

Moreno-Saiz, J. C., & Sainz-Ollero, H. (1992). *Atlas corológico de las monocotiledóneas endémicas de la Península Ibérica e islas Baleares*. ICONA.

Myers, N., Mittermeier, R., Mittermeier, C., da Fonseca, G. A. B., & Kent, J. (2000). Biodiversity hotspots for conservation priorities. *Nature*, *403*, 853–858. https://doi.org/10.1038/35002501

Nieto Feliner, G. (2014). Patterns and processes in plant phylogeography in the Mediterranean Basin. A review. *Perspectives in Plant Ecology, Evolution and Systematics*, *16*, 265–278. https://doi.org/10.1016/j.ppees.2014.07.002

Oksanen, J., Blanchet, F. G., Friendly, M., Kindt, R., Legendre, P., McGlinn, D., Minchin, P. R., O'Hara, R. B., Simpson, G. L., Solymos, P., Stevens, M. H. H., Szoecs, E., & Wagner, H. (2019). *vegan: Community ecology package*. R package version 2.5-6. https://CRAN.R-project.org/package=vegan

Pebesma, E. J., & Bivand, R. S. (2005). Classes and methods for spatial data in R. *R News*, *5*, 9–13.

Romero-Zarco, C. (2015). Las gramíneas de la Península Ibérica e Islas Baleares. In Jolube Consultor Botánico y (Ed.). *Colección Monografias de Botánica Ibérica* (pp.15). Jaca.

Sàbat, F., Gelabert, B., Rodríguez-Perea, A., & Giménez, J. (2011). Geological structure and evolution of Majorca: Implications for the origin of the Western Mediterranean. *Tectonophysics*, *510*, 217–238. https://doi.org/10.1016/j.tecto.2011.07.005

Sainz-Ollero, H., & Moreno-Saiz, J. C. (2002). Flora vascular endémica española. In F. D. Pineda, J. M. De Miguel, M. A. Casado, & J. Montalvo (Eds.), *La Diversidad Biológica de España* (pp. 175–195). CYTED. Prentice Hall.

Villar, L., Sesé, J. A., & Ferrández, J. V. (1997–2001). *Atlas de la flora del Pirineo Aragonés*. Consejo de Protección de la Naturaleza de Aragón e Instituto de Estudios Altoaragoneses.

Woodland, D. W. (2007). Are botanists becoming the dinosaurs of biology in the 21st century? *South African Journal of Botany*, *73*, 343–346. https://doi.org/10.1016/j.sajb.2007.03.005

BIOSKETCH

Ignacio Ramos-Gutiérrez is a PhD student conducting a dissertation about biogeographical patterns in Iberian vascular plants. The research group in which his thesis is framed is focused on macroecological patterns at different resolutions and is currently working on the development of modern, up-to-date bioregionalizations. This dataset represents a cornerstone of Ignacio Ramos-Gutiérrez's doctoral dissertation, because it will be the data to use for his analyses.

SUPPORTING INFORMATION

Additional supporting information may be found online in the Supporting Information section.

How to cite this article: Ramos-Gutiérrez, I., Lima H., Pajarón S., Romero-Zarco C., Sáez L., Pataro L., Molina-Venegas R., Rodríguez M. Á., & Moreno-Saiz J. C. (2021). Atlas of the vascular flora of the Iberian Peninsula biodiversity hotspot (AFLIBER). *Global Ecology and Biogeography*, 30, 1951–1957. https://doi.org/10.1111/geb.13363