Data in Brief 54 (2024) 110435

Contents lists available at ScienceDirect

Data in Brief

journal homepage: www.elsevier.com/locate/dib

Data Article

Insect and spider biodiversity: A dataset of mountainous wetland sites in Aspromonte National Park (Calabria, southern Italy)

Carmelo P. Bonsignore*, Elvira Castiglione, Francesco Manti

Dipartimento PAU (Patrimonio, Architettura e Urbanistica), Università degli Studi Mediterranea di Reggio Calabria, Via dell'Università 25, Reggio 89124 Calabria, Italy

ARTICLE INFO

Article history:
Received 22 February 2024
Revised 25 March 2024
Accepted 12 April 2024
Available online 18 April 2024

Dataset link: Count and species records of insects and spiders species from wetland sites in Aspromonte Mountain (Calabria region – South Italy) (Original data)

Keywords:
Climate change
Arthropods
Habitat
Conservation
Aquatic environments
Endangered species
Open Data Freshwater Community

ABSTRACT

Wetland areas encompass a range of natural habitats characterized by high animal and plant biodiversity. Understanding the impacts of environmental decline in such areas requires in-depth knowledge of the overall biodiversity. This study dataset provides a first evaluation of important sites of insect and arachnids biodiversity in peat bogs, marshes, and streams in Aspromonte National Park in Calabria, southern Italy. It is a basic faunal survey that aids understanding of the importance of these large faunal groups in sites mainly within this national park. The data obtained highlight a rich insect and spider diversity in this region and provide useful information to use to outline strategies for the conservation and the management of inland aquatic environments at risk from climate change. Moreover, as baseline data, these will be useful for future monitoring and management of other inland aquatic environments that are similar to those of the study sites reported herein.

* Corresponding author.
E-mail address: cbonsignore@unirc.it (C.P. Bonsignore).

https://doi.org/10.1016/j.dib.2024.110435

Specifications Table

Subject	Biological sciences
Specific subject area	Entomology and insect science
Type of data	Raw data, filtered per Habitat
Data collection	The first stage of data collection involved identifying wetland sites within the Aspromonte National Park, including marshes, peat bogs, and streams. Samples of adult insects and spiders were collected by using different types of trap, such as pitfall traps with attractant, light traps with liquid, and visible collection with a mowing net and/or entomological aspirator. Specimens were identified to a species level by the authors using a stereoscope and by specialist entomology and spider taxonomists around the world using taxonomic keys
Data source location	Insect and arachnid specimens were collected from 35 sites, many of which were in Aspromonte National Park (Italy). Secondary data relating to habitat type at different altitudes are summarized, including site, geographical coordinates, hydrographic network, and vegetation structure. The precise sampling coordinates for each site are provided with the raw data
Data accessibility	Repository name: Mendeley Data repository Data identification number: 10.17632/hcxvkfncgc.2 Direct URL to data: https://data.mendeley.com/datasets/hcxvkfncgc/2 Instructions for accessing these data: The data are freely accessible to scholars and their use must be agreed with the authors. For ethical reasons, the data will not be made available if they are to be used for commercial purposes.

1. Value of the Data

- Freshwater ecosystems are biodiversity hotspots [1]. These current data highlight the insect and spider diversity of the southernmost inland wetlands sites of the Italian Apennines;
- The specimen data obtained provide useful information necessary to outline strategies for the conservation and management of these important wetland areas;
- Data relating to the presence and distribution of endangered species with high conservation values can be a catalyst for further research and act as a starting point for modeling the presence of such species and identifying areas where they are at risk, as reported elsewhere [2];
- The upland bogs and other wetlands of the Aspromonte National Park could be recognized by governmental and conservation agencies as specific habitats for distinctive species not found elsewhere;
- For some species detected in our study, this was the first report of their occurrence in not only this study area, but also Italy as a whole. Such an awareness of these species in wetland areas could enable assessment of their future risk following the environmental decline of such habitats;
- Four hundred species of insects and 71 species of arachnids were identified, including species of Trichoptera (Kirby, 1813), Hemiptera (Linnaeus, 1758), Diptera (Linnaeus, 1758), Coleoptera (Linnaeus, 1758), and Lepidoptera, (Linnaeus, 1758), and members of the Araneae; in addition, species of Opiliones, and Scorpiones were also identified. There were differences between sample sites in terms of the most relevant orders of aquatic arthropods, which are important members of complex trophic chains within these wetland ecosystems.

2. Background

The first objective for creating this dataset on insect and spider of the freshwater ecosystems was to provide useful information to use to outline strategies for the conservation and the management of inland aquatic environments at risk from climate change. Second, the upland bogs and other wetlands of the study area could be recognized by governmental and conservation agencies as specific habitats for distinctive species not found elsewhere. Moreover, as baseline data for specific habitats, these will be useful for future monitoring and management of other inland aquatic environments that are similar to those of the study sites reported herein.

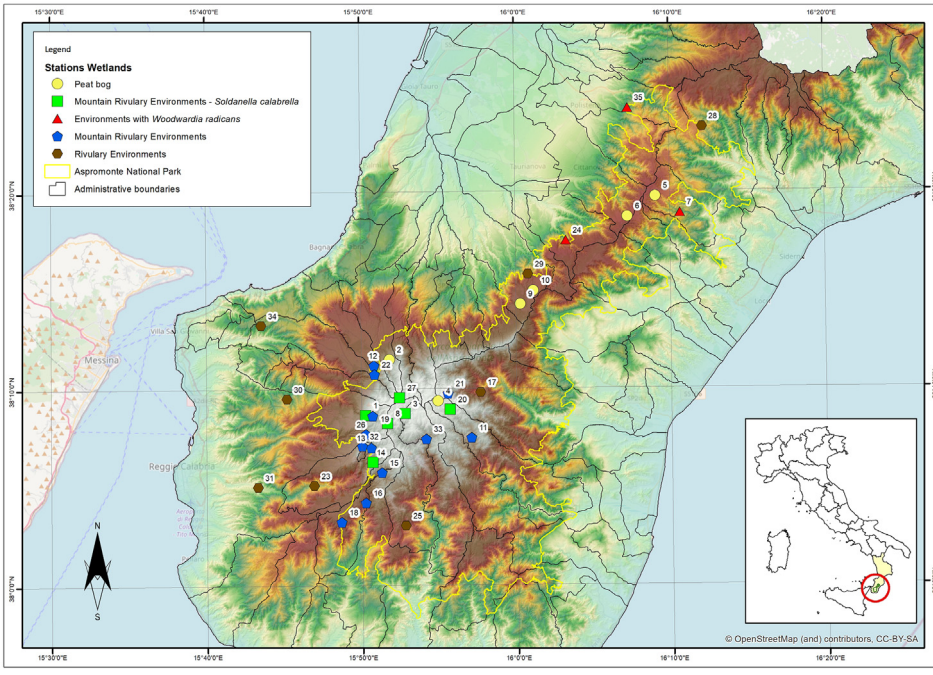

Fig. 1. Study area, sampling sites of wetland spots surveyed.

3. Data Description

This report describes datasets linked to a repository of insects and spiders collected from March to November 2018 and March to November 2019 at different wetland sites of the inland Aspromonte National Park, Italy (Fig. 1). The study comprised 35 survey sites sampled using using direct and undirect collecting methods. The survey sites and taxa were categorized according to the type of environment, altitude, and endemic plant species at each site (Table 1). Of these sites, 29 occurred within the different zoning designations of Aspromonte National Park and six occurred outside the park. From direct observation, some sites were subjected to overgrazing, with no action to protect against excessive growth of vegetation and afforestation. The natural or planted wooded phase too close to humid sites is, in fact, unfavorable for the maintenance of this type of habitat, especially in the dry climate zones [3–4]. The dataset contains six sheets [(a) Complete list of arthropod species; (b) peat bogs; (c) mountain stream (riverine) environment (characterized by *Soldanella calabrella*); (d) mountain stream environments; (e) environments characterized by *Woodwardia radicans*; and (f) stream environments] in a single Excel file. The data for the insect and spider specimens collected at each sample point include geographical coordinates, Class, Order, Family, Genus and Species, and the number of specimens (abundance). An overview of these sheets is provided in Table 2.

4. Experimental Design, Materials and Methods

4.1. Study region

Aspromonte National Park is located south of the Italian Apennines. The name derives from the Latin meaning ‘rugged’, or from the Greek ‘aspròs’, meaning white [10]. According to Blasi

Table 1
Types of inland wetland monitored and vegetational species group according to the annex to the Habitats Directive (Council Directive 92/43/EEC).

Type of environment	Typical botanical habitat	Habitats Directive (Council Directive 92/43/EEC)	No. of sites	Altitude (m asl)
Peat bog	*Sphagnum inundatium, Caricetum stellulatae* Brullo; *Ranunculo fontani, Potametum polygonifolii; Carici remotae-Osmundetum regalis* T	7140	6	910–1,806
Mountain riverine environments (*Soldanella calabrella*)	Tall hydrophilous herb fringe communities of plains and of montane to alpine level[a]	32A0: new according to Biondi et al., 2009 [5]	6	1,300–1,760
Mountain riverine environments	Streams and waterways in mountain and submountain belt; hygrophilous forests characterized by some endemism[a]	6430 and 32A0: lowland, mountain and alpine borders of hygrophilous megaforbs	12	916–1,767
Environments inhabited by *Woodwardia radicans*	*Quercetalia pubescenti-petraeae* Klika 1933, and *Querco roboris-Fagetea sylvaticae* Br.-Bl. & Vlieger in Vlieger 1937 (Blasi et al. 2004) [6][b]	7220: petrifying springs with tufa formation (*Cratoneurion*)	3	480–582
Riverine environments	Thermophilic oak forests, mesophilic forests, and others	Sites not associated with Habitats Directive	8	263–888

[a] Brullo et al. (2001) [7] frame this association in the alliance *Mycelido-Stachyon sylvaticae* Passarge 1967, which brings together the hygro-nitrophilous vegetation with an orophilous character, present in natural sections of the mountain belt; this alliance falls within the order *Circaeo-Stachyetalia sylvaticae* Passarge 1967 and in the *Galio-Urticetea* class Passarge ex Kopecky 1969.

[b] The *Woodwardia radicans* (L.) Sm. vegetation in the Aspromonte region on dripping walls is reported by Brullo et al. (2001) [7] at the *Conocephalo-Woodwardietum radicantis* Brullo, Lo Giudice & Privitera 1989 association of the *Polysticho setiferi-Phyllitidion scolopendri* alliance Ubaldi Ex Ubaldi & Biondi, reported by Biondi et al. 2014 [8], which brings together the bryophyte and pteridophyte vegetation on wetlands affected by dripping water.

et al. (2004) [6], the area falls within the Mediterranean ecoregion and lies in the southern province of Calabria. Its vegetation is varied, with widespread mesophilous and deciduous forests of beech, oaks and hornbeam (*Fagus sylvatica, Quercus robur, Quercus petraea, Quercus cerris, Quercus pubescens*, and *Carpinus betulus*). Key physiognomic vegetation types include coniferous forests of *Abies alba* and *Pinus nigra*, areas of Juniperus shrubs and *Dianthus rupicola*, Vaccinium heaths as well as *Carex, Sesleria, Nardus*, and Festuca grasslands. Studies of the arthropod biodiversity of this area are relatively sparse, because the area has been studied only sporadically; for example, the interesting entomological endemism of the area was reported only recently [11–12]. This lack of knowledge is also partially related to the difficulty of accessing sites because of the complex orography of the area. Thus, there is a need for further work to fully characterize the specific features of this region, in terms of not only its arthropod fauna but also its habitat types and geo-orography, given that other studies have highlighted features specific to this area, reinforcing the importance of this national park [13].

4.2. Climate of the area

Aspromonte National Park is located in the central Mediterranean Basin, surrounded from east to west by the sea. It is characterized by a heterogeneous topography and altitudes up to 1,956 m above sea level (asl). Precipitation shows strong seasonal variability as a consequence of the Mediterranean climate of the region. Maximum precipitation occurs in winter (550 mm); followed by autumn (450 mm) and spring (320 mm), and is very low during the summer (100

Table 2
Content of the related field dataset [9].

Latitude	Longitude	[1]WGS8433N_E	WGS8433N_N	Class	Order	Family	Genus	Current Taxon Name	Number of Specimens	[2]Coll/Legit	Station Code
Locality	Municipality	Type of environment		Hydrographic network		Quote (m asl)	National Park	National Park Zoning	[3]Name of ZSC (DH_RN2K)	[4]Cod DH_RN2K	Site
Reg_Biogeog	Region	Nation	Hectares_ZSC	[5]ZSC_ZPS							

[1] World Geodetic System (WGS)
[2] Coll/Legit = Collector
[3] ZSC = Special Areas of Conservation
[4] Cod DH_RN2K = Habitat directive- Natura 2000 network
[5] ZPS = Special Protection Areas

mm). The cold season (October 1 to March 31) accounts for >80 % of the total annual precipitation [14]. According to Federico et al. (2009) [14], the seasonal precipitation pattern in this national park is strongly related to its orography and the surrounding sea, reflecting the synoptic influence of its geographical features. The southeast region is the most drought-prone, whereas the western section of the park experiences higher yearly precipitation and the eastern region is affected by more intense rainstorms.

4.3. Habitat types in Aspromonte National Park

Aspromonte National Park is characterized by a variety of habitats related to the climate of the area (see above) and to various anthropological interventions. It has also been subject to increased afforestation over the past few decades. Table 1 provides describes the habitats that occur in Aspromonte National Park. Despite this remarkable heterogeneity, *S. calabrella* and *W. radicans* were used as reference sites for sampling because both species are representative of wetlands of considerable community importance. These streams and rivulets of the mountainous southern Apennines are characterized by weakly flowing, well-oxygenated waters and macrophytic herbaceous communities that host various endemic species. The location of each of the 35 study sites is provided in Fig. 1. All sites were located at an altitude above 400 m asl.

4.4. Species collection and identification

At each study site, arthropod samples were collected by using different types of trap, such as pitfall traps with attractant, light traps with liquid, and visible collection with a mowing net and/or entomological aspirator. Collected samples were preserved immediately in 75 % ethanol and transferred to the LEEA Laboratory, Dipartimento PAU, Università Mediterranea di Reggio Calabria, where they were then cleaned and stored in 75 % ethanol. All samples were identified to either the morphotype or species level by using the most recently published keys. In some cases, the samples were compared with insect collection and photos of holotypes. Specimens were labeled and preserved in the LEEA Collection, Civic Museum of Natural Sciences 'E. Caffi', Museum of Natural History of Verona. All data were organized alphabetically by class, family, genus and species in a checklist following scientific nomenclature and registered as a dataset in the Mendeley Data Repository (DOI:10.17632/hcxvkfncgc.2).

4.5. Insects and spiders species composition and distribution

Of the 471 terrestrial insect species identified, there were 163 species of Coleoptera, 77 species of Lepidoptera (mainly butterflies), 51 species of Trichoptera, 50 species of Hemiptera, and 44 species of Diptera, among others. Of the 73 species of Arachnida identified, there were 71 species of spider, two species of Opiliones, and one species of Scorpiones. The highest number of species of insects and spiders was recorded in peat bog sites (372 species) (Fig. 2). The caddisfly *Allogamus silanus* (Trichoptera, Limnephilidae) was reported for only the second time, to our knowledge [16]. A species of hemipteran new to this region of Calabria, *Psammotettix aspromontanus* n.sp., was recorded, which is morphologically similar to others *Psammotettix* spp. from which it is distinguished by the shape of the aedeagus; it was only collected from the study site at Montalto marsh at ~1,800 m asl, (Fig. 1, site 4) although its host plants were not determined [15]. The funnel weaver *Aterigena aspromontensis*, recently described by Bolzern et al. (2010) [16], was among the spiders recorded in the present study and reported [17]. The high number of endemic species recorded in this study could be because of the geological age of Aspromonte [10,18] and the fact that, similar to the other mountainous areas of the southern

Fig. 2. Habitats Directive CEE 43/92: 7140: Canolo peat bog (a) and Montalto marsh (b).

Apennines, it has been isolated from other European and Mediterranean territories for a significant length of time, enabling its fauna to evolve in isolation.

This dataset provides a first insight into the insects and spiders of freshwater and wetland sites in the Calabrian Apennines mountain massif located in southern Calabria, and it can serve as a model of a Mediterranean insular freshwater ecosystem. In addition to providing specific information on the distribution of the species identified in the different habitats investigated, this species dataset provides information on the freshwater community models necessary to create a detailed picture that is fundamental to understanding the effects of climate change. The information on taxonomic units represents data that could easily be repurposed, both through the addition of new data on regional biodiversity and by adding to the completeness of local reference databases. The public availability of these and other data for fragile areas around the world

means that such information could assist in future conservation planning, as well as additional data interpretation.

Limitations

Not applicable

Ethics Statement

Authors have read and follow the ethical requirements for publication in Data in Brief and confirming that the current work does not involve human subjects, animal experiments, or any data collected from social media platforms

Data availability

Count and species records of insects and spiders species from wetland sites in Aspromonte Mountain (Calabria region – South Italy) (Original data) (Mendeley Data)

CRediT Author Statement

Carmelo P. Bonsignore: Conceptualization, Methodology, Data curation, Writing – original draft, Funding acquisition; **Elvira Castiglione:** Data curation, Visualization, Investigation; **Francesco Manti:** Data curation, Visualization, Investigation.

Acknowledgements

We would like to thank Francesco Poggi for valuable help during the sampling campaigns and for specimen identification. We would also like to thank Antonio Siclari for providing in-depth information about the wetland sites and river systems studied. We also thank Paolo Pantini, Andrea Tagliapietra, Marco Valli, Ruud van der Weele, Adriano Zanetti, and Silvia Rocio Castro-Delgado for taxonomic support to identify the specimens collected.

Funding

This program was funded by Aspromonte National Park [Programma operativo FESR Calabria 2014/2020 OT 6 Azione 6.5.A1 'Monitoraggio Sic Terrestri in Aree Protette' - Regione Calabria - Progetto di studio e ricerca sulla biodiversità degli ambienti umidi del Parco Nazionale dell'Aspromonte – det. n. 199 del 13-03-2018].

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

References

[1] D.L. Strayer, D. Dudgeon, Freshwater biodiversity conservation: recent progress and future challenges, J. North Am. Benthol. Society 29 (2010) 344–358.

[2] J. C.J. Lortie, J. Braun, R. King, M. Westphal, The importance of open data describing prey item species lists for endangered species, Ecol. Solutions Evidence 4 (2023) e12251, doi:10.1002/2688-8319.12251.

[3] D.A. Stroud, T.M. Reed, M.W. Pienkowski, R.A. Lindsay, Birds, Bogs and Forestry, Peatlands Caithness Sutherland (1987) Nature Conservancy Council.

[4] Y. Xi, S. Peng, G. Liu, Trade-off between tree planting and wetland conservation in China, Nat. Commun. 13 (2022) 1967, doi:10.1038/s41467-022-29616-7.

[5] E. Biondi, C. Blasi, S. Burrascano, et al., Manuale Italiano di interpretazione degli habitat della Direttiva 92/43/CEE. (2009) (On line: https://www.mase.gov.it/sites/default/files/archivio/biblioteca/protezione_natura/manuale_interpretazione_habitat_it.pdf).

[6] C. Blasi, R. Di Pietro, L. Filesi, Syntaxonomical revision of Quercetalia pubescenti-petraeae in the Italian Peninsula, Fitosociologia 41 (2004) 87–164.

[7] S. Brullo, F. Scelsi, G. Spampinato, in: La Vegetazione dell'Aspromonte, Laruffa Editore, Studio fitosociologico, Reggio Calabria, 2001, p. 372.

[8] E. Biondi, M. Allegrezza, S. Casavecchia, New and validated syntaxa for the checklist of Italian vegetation, Plant Biosystem 148 (2014) 318–332.

[9] F. Manti, E. Castiglione, C.P. Bonsignore, Count and species records of insects and spiders species from wetland sites in Aspromonte Mountain (Calabria region – South Italy)", Mendeley Data (2024) V2, doi:10.17632/hcxvkfncgc.2.

[10] G. Robustelli, M. Sorriso-Valvo, The landscape of the Aspromonte Massif: a geomorphological open-air laboratory, in: M. Soldati, M. Marchetti (Eds.), Landscapes and Landforms of Italy. World Geomorphological Landscapes (eds), Springer, Cham, 2017, doi:10.1007/978-3-319-26194-2_37.

[11] C.P. Bonsignore, V.L.A. Laface, G. Vono, Threats Posed to the Rediscovered and Rare *Salvia ceratophylloides* Ard. (Lamiaceae) by borer and seed feeder insect species, Diversity. (Basel) 13 (2021) 33, doi:10.3390/d13010033.

[12] D. Patacchiola, F. Fabbriciani, P.L. Boschin, A new *Hoplia* Illiger, 1803 from Calabria, southern Italy (Coleoptera: Scarabaeidae: Melolonthinae: Hopliini), Zootaxa 12 (2022) 5219 365-374PMID: 37044563, doi:10.11646/zootaxa.5219.4.4.

[13] G. Spampinato, V. Tomaselli, L. Forte, Relevant but neglected habitat types by the Directive 92/43 EEC in southern Italy, Rendiconti Lincei – Scienze Fisiche e Naturali 34 (2023) 457–482, doi:10.1007/s12210-023-01136-6.

[14] S. Federico, E. Avolio, L. Pasqualoni, L. De Leo, A.M. Sempreviva, C. Bellecci, Preliminary results of a 30-year daily rainfall data base in southern Italy, Atmos. Res. 94 (2009) 641–651.

[15] F. Poggi, F. Manti, E. Castiglione, Descrizione di una nuova specie di *Psammotettix* della Calabria (Hemiptera Cicadellidae Deltocephalinae), Bollettino Della Società Entomologica Italiana 151 (2019) 7–12, doi:10.4081/BollettinoSEI.2019.7.

[16] A. Bolzern, A. Hänggi, D. Burckhardt, Aterigena, a new genus of funnel-web spider, shedding some light on the Tegenaria-Malthonica problem (Araneae: Agelenidae).J. Arachnol. 38 (2010) 162-182.

[17] P. Pantini, F. Mazzoleni, I ragni di Calabria, (Arachnida, Araneae). Rivista del Museo civico di Scienze Naturali "E. Caffi", Bergamo 31 (2018) 11–70.

[18] A. Fornelli, V. Festa, F. Micheletti, R. Spiess, F. Tursi, Building an orogen: review of u-pb zircon ages from the calabria–peloritani terrane to constrain the timing of the southern variscan belt, Minerals 10 (2020) 944, doi:10.3390/min10110944.