Fauna Europaea - Orthopteroid orders

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Abstract

Fauna Europaea provides a public web-service with an index of scientific names (including important synonyms) of all extant European terrestrial and freshwater animals, their geographical distribution at the level of countries and major islands (west of the Urals and excluding the Caucasus region), and some additional information. The Fauna Europaea project comprises about 230,000 taxonomic names, including 130,000 accepted species and 14,000 accepted subspecies, which is much more than the originally projected number of 100,000 species. Fauna Europaea represents a huge effort by more than 400 contributing specialists throughout Europe and is a unique (standard) reference suitable for many users in science, government, industry, nature conservation and education.

The “Orthopteroid orders” is one of the 58 Fauna Europaea major taxonomic groups. It contains series of mostly well-known insect orders: Embiodea (webspinners), Dermaptera (earwigs), Phasmatodea (walking sticks), Orthoptera s.s. (grasshoppers, crickets, bush-crickets) and Dictyoptera with the suborders Mantodea (mantids), Blattaria (cockroaches) and Isoptera (termites).

For the Orthopteroid orders, data from 35 families containing 1,371 species are included in this paper.
Introduction

In 1998 the European Commission published the European Community Biodiversity Strategy, providing a framework for development of Community policies and instruments in order to comply with the Convention on Biological Diversity. This Strategy recognises the current incomplete state of knowledge at all levels of biodiversity, a state which makes a successful implementation of the Convention difficult. Fauna Europaea was conceived to contribute to this Strategy by supporting one of the main themes: to identify and catalogue the components of European biodiversity, with the cataloguing implemented as a taxonomic and faunistic database serving as a basic tool for scientific documentation and discovery, environmental management, and conservation policies/priorities.

With regard to biodiversity in Europe, science and policies depend on sufficient knowledge of the relevant components. The assessment of biodiversity, monitoring changes, sustainable exploitation of biodiversity, as well as much legislative work depend upon a validated taxonomic overview, in which Fauna Europaea plays a major role by providing a web-based information infrastructure with an index of scientific names (including the most important synonyms) of all living European multicellular terrestrial and freshwater animals, their geographical distribution at the level of countries and major islands, and some relevant additional information. In this sense, the Fauna Europaea database provides a unique reference for many user-groups such as scientists, governments, industries, conservation communities and educational programs.

Fauna Europaea (FaEu) kicked off in 2000 as an EC-FP5 four-year project, delivering its first release in 2004 (Jong de et al. 2014). Fauna Europaea has continuously been updated, and after a further decade of steady progress, to efficiently disseminate the results of Fauna Europaea and to properly credit the Fauna Europaea contributors, modern e-publishing tools are being applied to prepare data papers on all 58 major taxonomic groups. For this purpose a special Biodiversity Data Journal Series has been compiled, called Contributions on Fauna Europaea (see also: Pensoft News item 17 Dec 2014). This work was initiated during the ViBRANT project and is further supported by the recently started EU BON project.

In the EU BON project also further steps will be made to implement Fauna Europaea as a basic tool and standard reference for biodiversity research and as a means to facilitate taxonomic expertise evaluation and management in Europe, including its contributions to the European Taxonomic Backbone (PESI / EU-nomen) project (Jong de et al. 2015).
This paper is the first publication from the *Fauna Europaea Orthopteroid Orders* data sector as a *BDJ* data paper in the *Fauna Europaea series*. The paper is dedicated to Fer Willemse, prominent orthopterologist, respected member of our Fauna Europaea community and co-author of this paper, who passed away in 2009.

**General description**

**Purpose:** *Fauna Europaea* is a database of the scientific names and distributions (at national or in some cases regional level) of all currently known extant multicellular European terrestrial and freshwater animal species. The database has been assembled by a large network of taxonomic specialists. An extended description of the *Fauna Europaea* project can be found in Jong de et al. (2014). A summary is given in the sections below.

The *Orthopteroid Orders* is one of the 58 *Fauna Europaea* major taxonomic groups, covering 1,371 species. The data were acquired and checked by a network of 4 specialists (Tables 1, 2).

| TAXONOMY | FAMILY | SPECIALIST(S) | DATABASED SPECIES (Fauna Europaea) | TOTAL ESTIMATED SPECIES (knowledge-gap) |
|----------|--------|---------------|------------------------------------|----------------------------------------|
| FAMILY   |        |               |                                    |                                        |
|          | Acrididae | Klaus-Gerhard Heller | 331                                | ~ 20% more species                      |
|          | Amorphoscelididae | Klaus-Gerhard Heller | 1                                  | ~ 20% more species                      |
|          | Anisolabididae | Fabian Haas | 11                                 | ~ 20% more species                      |
|          | Bacillidae | Klaus-Gerhard Heller | 7                                  | ~ 20% more species                      |
|          | Blaberidae | Horst Bohn | 4                                  | ~ 20% more species                      |
|          | Blattellidae | Horst Bohn | 140                                | ~ 20% more species                      |
|          | Blattidae | Horst Bohn | 4                                  | ~ 20% more species                      |
|          | Bradyporidae | Klaus-Gerhard Heller | 85                                | ~ 20% more species                      |
|          | Conocephalidae | Klaus-Gerhard Heller | 11                                | ~ 20% more species                      |
|          | Embiidae | Klaus-Gerhard Heller | 9                                  | ~ 20% more species                      |
|          | Empusidae | Klaus-Gerhard Heller | 5                                  | ~ 20% more species                      |
|          | Forficulidae | Fabian Haas | 62                                 | ~ 20% more species                      |
|          | Gryllidae | Klaus-Gerhard Heller | 81                                | ~ 20% more species                      |
|          | Gryllotalpidae | Klaus-Gerhard Heller | 14                                | ~ 20% more species                      |
| Insect Order               | Specialist                        | Species | Notes          |
|---------------------------|-----------------------------------|---------|----------------|
| Heteronemidae             | Klaus-Gerhard Heller              | 6       | ~ 20% more species |
| Kalotermitidae            | Klaus-Gerhard Heller              | 4       | ~ 20% more species |
| Labiduridae               | Fabian Haas                       | 2       | ~ 20% more species |
| Mantidae                  | Klaus-Gerhard Heller              | 30      | ~ 20% more species |
| Meconematidae             | Klaus-Gerhard Heller              | 10      | ~ 20% more species |
| Mogoplistidae             | Klaus-Gerhard Heller              | 11      | ~ 20% more species |
| Myrmecophilidae           | Klaus-Gerhard Heller              | 9       | ~ 20% more species |
| Oligotomidae              | Klaus-Gerhard Heller              | 4       | ~ 20% more species |
| Pamphagidae               | Klaus-Gerhard Heller              | 52      | ~ 20% more species |
| Phaneropterida            | Klaus-Gerhard Heller              | 156     | ~ 20% more species |
| Phasmatidae               | Klaus-Gerhard Heller              | 4       | ~ 20% more species |
| Polyphagidae              | Horst Bohn                        | 8       | ~ 20% more species |
| Pygidicranidae            | Fabian Haas                       | 3       | ~ 20% more species |
| Pyrgomorphidae            | Klaus-Gerhard Heller              | 5       | ~ 20% more species |
| Rhaphidophoridae          | Klaus-Gerhard Heller              | 49      | ~ 20% more species |
| Rhinotermitidae           | Klaus-Gerhard Heller              | 7       | ~ 20% more species |
| Spongiphoridae            | Fabian Haas                       | 5       | ~ 20% more species |
| Termitidae                | Horst Bohn                        | 1       | ~ 20% more species |
| Tettigidae                | Klaus-Gerhard Heller              | 12      | ~ 20% more species |
| Tettigoniidae             | Klaus-Gerhard Heller              | 222     | ~ 20% more species |
| Tridactylidae             | Klaus-Gerhard Heller              | 6       | ~ 20% more species |

Table 2.
Responsible associated specialists in Orthoptera.

| GROUP or AREA       | SPECIALIST                      |
|---------------------|--------------------------------|
| Orthoptera-Saltatoria | Fer Willemse [deceased] — Luc Willemse [follow-up] (see: Willemse and Willemse 2010) |
| Phasmida            | Paul Brock                     |
| Corydidae           | Heidi Hopkins                  |
| Embioptera          | Mike Maehr                     |
| Blattaria           | George Beccaloni               |

Additional information: Introduction Orthopteroid Orders
Under the name “Orthopteroid orders” in the wide sense as used here all orders (except Plecoptera: stoneflies) are combined which make up the group (superorder) Polyneoptera (e.g. Grimaldi and Engel 2004): *Embiodea* (webspinners), *Dermaptera* (earwigs), *Phasmatodea* (walking sticks), Orthoptera s.s. (grasshoppers, crickets, bush-crickets) and *Dictyoptera* with the suborders *Mantodea* (mantids), *Blattaria* (cockroaches) and *Isoptera* (termites), for which information can be easily obtained in the internet (e.g. wikipedia).

A compilation of references, used for the preparation of the first version, is appended under ‘Additional Information’ below.

**Project description**

**Title:** This BDJ data paper includes the taxonomic indexing efforts in the *Fauna Europaea* on European Orthoptera covering the first two versions of *Fauna Europaea* worked (up to version 2.6).

**Personnel:** Taxonomic framework of *Fauna Europaea* includes partner institutes, which together with a number of local- and citizen scientists provide the taxonomic expertise and faunistic quality assurance and take care of data collation.

Every taxonomic group is covered by at least one Group Coordinator responsible for the supervision and integrated input of taxonomic and occurrence data of a particular group. For Orthoptera the responsible Group Coordinators is Klaus-Gerhard Heller.

The *Fauna Europaea* checklist would not have reached its current level of completion without the input from several groups of specialists. The formal responsibility of collating and delivering the data for relevant families has resided with the appointed Taxonomic Specialists (see Table 1). Associate Specialists deserve due credit for their important contributions at various levels, including particular geographic regions or (across) taxonomic groups (see Table 2).

Data management tasks were taken care about by the *Fauna Europaea* project bureau. During the project phase (until 2004) a network of principal partners took care about diverse management tasks: Zoological Museum Amsterdam (general management & system development), Zoological Museum of Copenhagen (data collation), National Museum of Natural History in Paris (data validation) and Museum and Institute of Zoology in Warsaw (Newly Associated States [NAS] extension). From the formal termination of the project in 2004 to 2013, all tasks were taken over by the Zoological Museum Amsterdam.

**Study area description:** The study area covers the western Palaearctic, including the European mainland, Great Britain, the Macaronesian islands, Cyprus, Faroe Islands, Iceland, Svalbard, Franz Josef Land and Novaya Zemlya, but excluding (non-European) Turkey, the Caucasus, western Kazakhstan, the Arabian Peninsula and North Africa (Fig. 1).
Design description: Standards. Group Coordinators and taxonomic specialists have been delivering the (sub)species names according to strict standards. The names provided by Fauna Europaea are scientific names. The taxonomic scope includes issues like, (1) the definition of criteria used to identify the accepted species-group taxa, (2) the hierarchy (classification scheme) for the accommodation of all accepted (sub)species, (3) relevant synonyms, and (4) the correct nomenclature. The Fauna Europaea ‘Guidelines for Group Coordinators and Taxonomic Specialists’ (Suppl. material 1) include the standards, protocols, scope and geographical limits and provide the instructions for the more than 400 taxonomic specialists contributing to the project, following the provisions of the International Code of Zoological Nomenclature.

Data management. The data records could either be entered offline into a preformatted MS-Excel worksheet or directly into the Fauna Europaea transaction database using an online browser interface (Fig. 2). The data servers were hosted at the Academic Informatics Center of the University of Amsterdam (SARA/Vancis). Since 2013 the data servers are hosted at the Museum für Naturkunde in Berlin, and a new data entry (update) tool is under development.

Data set. The Fauna Europaea basic data set consists of: accepted (sub)species names (including authorship), synonym names (including authorship), a taxonomic hierarchy / classification, misapplied names (including misspellings and alternative taxonomic views), homonym annotations, expert details, European distribution (at country level or major islands), global distribution (only for European species), taxonomic reference (optional), occurrence reference (optional).

Funding: Fauna Europaea was funded by the European Commission under the Fifth Framework Programme and contributed to the Support for Research Infrastructures work programme with Thematic Priority Biodiversity (EVR1-1999-20001) for a period of four
years (1 March 2000 – 1 March 2004), including a short 'NAS extension', allowing EU candidate accession countries to participate. Follow-up support was given by the EC-FP5 EuroCAT project (EVR1-CT-2002-20011), by the EC-FP6 ENBI project (EVK2-CT-2002-20020), by the EC-FP6 EDIT project (GCE 018340), by the EC-FP7 PESI project (RI-223806) and by the EC-FP7 VIBRANT project (RI-261532). Continued management and hosting of the Fauna Europaea services was supported by the University of Amsterdam (Zoological Museum Amsterdam) and SARA/Vancis. Recently, the hosting of Fauna Europaea was taken over by the Museum für Naturkunde in Berlin, supported by the EC-FP7 EU BON project (grant agreement ENV-308454).

Additional support for preparing the Orthoptera data set was received through the numerous institutions allowing for the proper allocation of time by the contributing taxonomic specialists.

**Sampling methods**

**Study extent:** See spatial coverage and geographic coverage descriptions.

**Sampling description:** Fauna Europaea data have been assembled by principal taxonomic experts, based on their individual expertise, which includes literature study, collection research, and field observations. In total 476 taxonomic specialists contributed taxonomic and/or faunistic information for Fauna Europaea. The vast majority of the experts are from Europe (including EU non-member states). As a unique feature, Fauna Europaea funds were set aside for paying/compensating for the work of taxonomic specialists and Group Coordinators (around five Euro per species).
To facilitate data transfer and data import, sophisticated on-line (web interfaces) and off-line (spreadsheets) data-entry routines were built, well integrated within an underlying central *Fauna Europaea* transaction database (see Fig. 2). This includes advanced batch data import routines and utilities to display and monitor the data processing within the system. In retrospect, it seems that the off-line submission of data was probably the best for bulk import during the project phase, while the on-line tool was preferred to enter modifications in later versions. This system worked well until 2013, but will be replaced by a new system in 2016.

A first release of the *Fauna Europaea* index via the web-portal has been presented at 27th of September 2004, whereas the most recent release (version 2.6.2) was launched at 29 August 2013. An overview of *Fauna Europaea* releases can be found here: [http://www.faunaeur.org/about_fauna_versions.php](http://www.faunaeur.org/about_fauna_versions.php).

**Quality control:** *Fauna Europaea* data are unique in the sense that they are fully expert based. Selecting leading experts for all groups provided a principal assurance of the systematic reliability and consistency of the *Fauna Europaea* data.

Furthermore, all *Fauna Europaea* data sets are intensively reviewed at regional and thematic validation meetings, at review sessions on taxonomic symposia (for some groups), by *Fauna Europaea* Focal Points (during the FaEu-NAS and PESI projects) and by various end-users sending annotations using the web form at the web-portal. Additional validation on gaps and correct spellings was effected by the validation office the [National Museum of Natural History](http://www.nhm.ac.uk) in Paris.

Checks on technical and logical correctness of the data were implemented by the data entry tools, including around 50 'Taxonomic Integrity Rules'. This validation tool proved to be of considerable value for both the taxonomic specialists and project management, and significantly contributed to the preparation of a remarkably clean and consistent data set.

This thorough review procedure makes *Fauna Europaea* the most scrutinised data set in its domain. In general we expected to get taxonomic data for 99.3% of the known European fauna directly after the initial release of *Fauna Europaea* (Jong de et al. 2014). The faunistic coverage is not quite as good, but is nevertheless 90-95% of the total fauna. For the Orthoptera, the taxonomic completeness is difficult to estimate (see also Heller et al. 1998). The total number of existing Orthoptera species in Europe is supposed to be around 20% higher compared to the current knowledge level (see Table 1).

To optimise the use and implementation of a uniform and correct nomenclature, a cross-referencing of the Fauna Europaea Orthopteroid data-set with relevant taxonomic resources is recommended, also supporting the global efforts on establishing a global taxonomic resolution service, provisionally called 'Global Names Architecture' (Pyle and Michel 2008, Jong de et al. 2015). Applicable nomenclature databases specifically dedicated to Orthopteroid species includes: Orthoptera Species File, Phasmida Species File Online, Dermaptera Species File, Cockroach Species File Online, Embioptera Species File Online, and Mantodea Species File Online. As a preparation, a semi-automatic
validation on selected Orthopteroid species data files has been carried out, with help of the responsible curators, using the PESI Taxon Match Tool and LifeWatch Backbone services (Suppl. material 3). The results are cross-indexed with the Global Names Index and could be used to further integrate the Fauna Europaea and Orthopteroid species databases and web-services.

**Step description:** By evaluating team structure and life cycle procedures (data-entry, validation, updating, etc.), clear definitions of roles of users and user-groups according to the taxonomic framework were established, including ownership and read/write privileges, and and their changes during the project’s life-cycle. In addition, guidelines on common data exchange formats and codes have been issued (see also Suppl. material 1).

**Geographic coverage**

**Description:** Species and subspecies distributions in Fauna Europaea are registered at least at the level of (political) country. For this purpose the FaEu geographical system basically follows the TDWG standards (see: Suppl. material 1). The area studied covers the western Palaearctic west of the Urals, including the European mainland, Great Britain, the Macaronesian islands, Cyprus, Faroe Islands, Iceland, Svalbard, Franz Josef Land and Novaya Zemlya, but excluding (non-European) Turkey, the Caucasus, western Kazakhstan, the Arabian Peninsula and North Africa (see Fig. 1).

The focus is on species (or subspecies) of European multicellular animals of terrestrial and freshwater environments. Species in brackish waters, occupying the marine/freshwater or marine/terrestrial transition zones, are generally excluded.

**Coordinates:** Mediterranean (N 35°) and Arctic Islands (N 82°) Latitude; Atlantic Ocean (Mid-Atlantic Ridge) (W 30°) and Ural (E 60°) Longitude.

**Taxonomic coverage**

**Description:** The Fauna Europaea database contains the scientific names of all living European land and freshwater animal species, including numerous infra-groups and synonyms. More details about the conceptual background of Fauna Europaea and standards followed are described above and in the project description paper(s). Figs 3, 4, 5, 6, 7

This data paper covers the Orthopteroid Orders content of Fauna Europaea, including 35 families, 1,371 species, 48 subspecies and 201 (sub)species synonyms (see Fig. 8). Higher ranks are given below, the species list can be downloaded (see: Data resources).
Figure 3.
Order Dermaptera, Family Labiduridae, *Labidura riparia* (Pallas 1773). Location: Greece, river Tauropos between Arta and Karpenision. Photo by Klaus-Gerhard Heller.

Figure 4.
Order Dictyoptera, Suborder Mantodea, Family Mantidae, *Pseudoyersinia paui* (Bolivar 1898): Mating. Location: Spain, Bovalar near Morella. Photo by Klaus-Gerhard Heller.
Figure 5.
Order Orthoptera, Suborder Caelifera, Superfamily Acridoidea, Family Acrididae, *Chorthippus lacustris* La Greca & Messina 1975: Courtship. Location: Greece, Ioannina. Photo by Klaus-Gerhard Heller.

Figure 6.
Order Orthoptera, Suborder Ensifera, Superfamily Tettigonioidae, Family Tettigoniidae, *Rhacocleis crypta* F. Willemse & L. Willemse 2005. Location: Greece, Mount Gavrogo near Arta. Photo by Klaus-Gerhard Heller.
Figure 7.
Order Phasmatodea, Family Heteronemiidae, *Pijackeria luciana* Scali, Milani & Passamonti 2013: Mating. Location: Spain, Ibi near Alcoy. Photo by Klaus-Gerhard Heller.

Figure 8.
FaEu Orthoptera species per family. See Table 1 for family statistics. For full resolution see Suppl. material 2. Further details on the Fauna Europaea Orthoptera classification can be found here: [http://www.faunaeur.org/experts.php?id=55](http://www.faunaeur.org/experts.php?id=55).
### Taxa included:

| Rank     | Scientific Name |
|----------|-----------------|
| kingdom  | Animalia        |
| subkingdom | Eumetazoa      |
| phylum   | Arthropoda      |
| subphylum | Hexapoda       |
| class    | Insecta         |
| order    | Dermaptera      |
| family   | Anisolabididae  |
| subfamily | Carcinophorinae |
| subfamily | Pseudisolabilinae |
| family   | Forficulidae    |
| subfamily | Allodahlinae    |
| subfamily | Anechurinae     |
| subfamily | Forficulinae    |
| family   | Labiduridae     |
| subfamily | Labidurinae     |
| subfamily | Nalinae         |
| family   | Pygidicranidae  |
| subfamily | Anataelinae     |
| family   | Spongiphoridae  |
| subfamily | Isolaboidinae   |
| subfamily | Labilinae       |
| subfamily | Spongiphorinae  |
| order    | Dictyoptera     |
| suborder | Blattodea       |
| family   | Blaberidae      |
| subfamily | Blaberinae      |
| subfamily | Oxyhaloinae     |
| subfamily | Pycnoscelinae   |
| family   | Blattellidae    |
| Taxonomic Level | Subdivision |
|-----------------|-------------|
| subfamily       | Blattellinae |
| subfamily       | Ectobiinae  |
| subfamily       | Pseudophyllodromiinae |
| family          | Blattidae   |
| subfamily       | Blattinae   |
| family          | Polyphagidae|
| subfamily       | Euthyrhaphinae |
| subfamily       | Polyphaginae |
| suborder        | Isoptera    |
| family          | Kalotermitidae |
| family          | Rhinotermitidae |
| family          | Termitidae  |
| suborder        | Mantodea    |
| family          | Amorphoscelididae |
| family          | Empusidae   |
| family          | Mantidae    |
| order           | Embioptera  |
| family          | Embiidae    |
| family          | Oligotomidae|
| order           | Orthoptera  |
| suborder        | Caelifera   |
| superfamily     | Acridoidea  |
| family          | Acrididae   |
| subfamily       | Acridinae   |
| subfamily       | Calliptaminae|
| subfamily       | Catantopinae|
| subfamily       | Cyrtacanthacridinae |
| subfamily       | Dericorythinae |
| subfamily       | Egnatiinae  |
| subfamily       | Eyprepcnemidinae |
| subfamily       | Gomphocerinae |
| subfamily          | Oedipodinae                        |
|--------------------|-----------------------------------|
| subfamily          | Tropidopolinae                     |
| family             | Pamphagidae                        |
| subfamily          | Akicerinae                         |
| subfamily          | Pamphaginae                        |
| family             | Pyrgomorphidae                     |
| subfamily          | Pyrgomorphinae                     |
| superfamily        | Tetigoidea                         |
| family             | Tetrigidae                         |
| superfamily        | Tridactyloidea                     |
| family             | Tridactylidae                      |
| suborder           | Ensifera                           |
| superfamily        | Grylloidea                         |
| family             | Gryllidae                           |
| subfamily          | Gryllinae                           |
| subfamily          | Gryllomorphinae                    |
| subfamily          | Nemobiinae                          |
| subfamily          | Oecanthinae                         |
| subfamily          | Trigonidiinae                      |
| family             | Gryllotalpidae                     |
| family             | Mogoplistidae                      |
| family             | Myrmecophilidae                    |
| superfamily        | Rhaphidophoroidea                  |
| family             | Rhaphidophoridae                   |
| subfamily          | Dolichopodainae                    |
| subfamily          | Rhaphidophorinae                   |
| subfamily          | Troglophilinae                     |
| superfamily        | Tettigonioida                      |
| family             | Bradyporidae                       |
| family             | Conocephalidae                     |
| family             | Meconematidae                      |
family Phaneropteridae
family Tettigoniidae
order Phasmatodea
family Bacillidae
family Heteronemiidae
family Phasmatidae

Temporal coverage

Living time period: Currently living.

Notes: Currently living animals in stable populations, largely excluding (1) rare/irregular immigrants, intruder or invader species, (2) accidental or deliberate releases of exotic (pet) species, (3) domesticated animals, (4) foreign species imported and released for bio-control or (5) foreign species largely confined to hothouses.

Usage rights

Use license: Open Data Commons Attribution License

IP rights notes: Fauna Europaea data are licensed under CC BY SA version 4.0. The experts keep property rights over their data, initially covered under the FaEu/SMEBD conditions. For more copyrights and citation details see: http://www.faunaeur.org/copyright.php.

For correct use and citing of the Orthopteroid data sets (Suppl. material 3), please check the relevant websites.

Data resources

Data package title: Fauna Europaea - Orthopteroids

Resource link: http://www.faunaeur.org/Data_papers/FaEu_Orthopteroids_2.6.2.zip

Alternative identifiers: http://www.faunaeur.org/full_results.php?id=11883

Number of data sets: 2

Data set name: Fauna Europaea - Orthopteroids version 2.6.2 - species

Character set: UTF-8

Download URL: http://www.faunaeur.org/Data_papers/FaEu_Orthopteroids_2.6.2.zip
### Data format: CSV

| Column label            | Column description                                                                 |
|-------------------------|-------------------------------------------------------------------------------------|
| datasetName             | The name identifying the data set from which the record was derived (http://rs.tdwg.org/dwc/terms/datasetName). |
| version                 | Release version of data set.                                                        |
| versionIssued           | Issue data of data set version.                                                     |
| rights                  | Information about rights held in and over the resource (http://purl.org/dc/terms/rights). |
| rightsHolder            | A person or organization owning or managing rights over the resource (http://purl.org/dc/terms/rightsHolder). |
| accessRights            | Information about who can access the resource or an indication of its security status (http://purl.org/dc/terms/accessRights). |
| taxonID                 | An identifier for the set of taxon information (http://rs.tdwg.org/dwc/terms/taxonID). |
| parentNameUsageID       | An identifier for the name usage of the direct parent taxon (in a classification) of the most specific element of the scientificName (http://rs.tdwg.org/dwc/terms/parentNameUsageID). |
| scientificName          | The full scientific name, with authorship and date information if known (http://rs.tdwg.org/dwc/terms/scientificName). |
| acceptedNameUsage       | The full name, with authorship and date information if known, of the currently valid (zoological) taxon (http://rs.tdwg.org/dwc/terms/acceptedNameUsage). |
| originalNameUsage       | The original combination (genus and species group names), as firstly established under the rules of the associated nomenclaturalCode (http://rs.tdwg.org/dwc/terms/originalNameUsage). |
| family                  | The full scientific name of the family in which the taxon is classified (http://rs.tdwg.org/dwc/terms/family). |
| familyNameId            | An identifier for the family name.                                                  |
| genus                   | The full scientific name of the genus in which the taxon is classified (http://rs.tdwg.org/dwc/terms/genus). |
| subgenus                | The full scientific name of the subgenus in which the taxon is classified. Values include the genus to avoid homonym confusion (http://rs.tdwg.org/dwc/terms/subgenus). |
| specificEpithet         | The name of the first or species epithet of the scientificName (http://rs.tdwg.org/dwc/terms/specificEpithet). |
| infraspecificEpithet    | The name of the lowest or terminal infraspecific epithet of the scientificName, excluding any rank designation (http://rs.tdwg.org/dwc/terms/infraspecificEpithet). |
| Column label               | Column description                                                                                                                                 |
|----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|
| datasetName                | The name identifying the data set from which the record was derived (http://rs.tdwg.org/dwc/terms/datasetName).                                           |
| version                    | Release version of data set.                                                                                                                                 |
| versionIssued              | Issue data of data set version.                                                                                                                                 |
| rights                     | Information about rights held in and over the resource (http://purl.org/dc/terms/rights).                                                           |
| rightsHolder               | A person or organization owning or managing rights over the resource (http://purl.org/dc/terms/rightsHolder).                                      |
| accessRights               | Information about who can access the resource or an indication of its security status (http://purl.org/dc/terms/accessRights).                    |
| taxonName                  | The full scientific name of the higher-level taxon.                                                                                               |
| scientificNameAuthorship   | The authorship information for the scientificName formatted according to the conventions of the applicable nomenclaturalCode (http://rs.tdwg.org/dwc/terms/scientificNameAuthorship). |

**Data set name:** Fauna Europaea - Orthopteroids version 2.6.2 - hierarchy

**Character set:** UTF-8

**Download URL:** [http://www.faunaeur.org/Data_papers/FaEu_Orthopteroids_2.6.2.zip](http://www.faunaeur.org/Data_papers/FaEu_Orthopteroids_2.6.2.zip)

**Data format:** CSV
Additional information

For the first compilation of the list of European Orthoptera, Dermaptera, *Dictyoptera* (*Blattaria*, *Isoptera*, *Mantodea*), Embioptera and *Phasmatodea*, released at 27 September 2004, the following bibliographic references have mainly been used.

**General taxonomy and faunistics:** Benediktov 1999, Brock 1991, Buchvalova 1998, Clemente et al. 1989, Clemente et al. 1991, Clemente et al. 1990, Clemente et al. 1999, Coray and Lehmann 1998, Devriese 1996, Gorochov 1987, Gorochov and Marshall 2001, Günther 1995, Harz 1975, Harz and Kaltenbach 1976, Heller 1988, Heller et al. 1998, Jago 1971, Jago 1996, La Greca 1993, La Greca and Lombardo 1983, Massa 1994a, Massa 1994b, Massa 1999, Nadig 1981, Nadig 1991, Nadig 1994, Ragge and Reynolds 1998, Reynolds 1980, Ross 1966, Us and Matvejew 1967

Per country (listing follows the TDWG country codes):

**Andorra (AD):** Marty 1969, Vahed 1994

**Albania (AL):** Cejchan 1981, Murraj et al. 1970

**Austria (AT):** Berg et al. 2000, Schraut 1999

**Bosnia & Herzegovina (BA):** Adamovic 1956, Miksic 1960, Miksic 1966, Miksic 1967, Miksic 1973, Miksic 1974, Miksic 1978, Miksic 1981

**Belgium (BE):** Declerq 1990, Georges 1984, Naveau 1985

**Bulgaria (BG):** Bey-Bienko and Peschev 1960, Peshev 1962, Peshev 1964, Peshev 1970, Peshev 1974, Peshev 1975, Peshev and Djingova 1974, Peshev and Maran 1963, Popov et al. 2001

**Switzerland (CH):** Baur et al. 2000, Thorens and Nadig 1997

**Cyprus (CY):** Georghiou 1977, Mantovani et al. 1995
Czech Republic (CZ): Chladek et al. 2000, Kocarek et al. 1999

Germany (DE): Detzel 2001

Denmark (DK): Fogh Nielsen 2000, Jensen 2002

Spain (ES): Baez 1996, Bland 2001, Bland et al. 1996, Gangwere and Llorente 1992, Garcia et al. 1996, Gomez et al. 1998, Gorochov and Llorente 2001, Herrera Mesa 1982, Llorente and Presa 1997, Olmo-Vidal 1999, Olmo-Vidal and Hernando 2000, Pfau 1996, Pfau and Pfau 1995

France (FR): Defaut 1999, Kruseman 1982, Kruseman 1988, Voisin 2003

Britain (GB): Haes 2003, Hathway et al. 2003, Hawkins 2001, Lee 1998, Marshall and Haes 1990

Greece (GR): Baccetti 1992, Kollaros et al. 1991, Willemse 1984, Willemse 1985

Hungary (HU): Nagy 1997, Nagy et al. 1999, Nagy and Szövenyi 1997

Italy (IT): Baccetti et al. 1995, Failla et al. 1995, Fontana 2001, Fontana and Cussigh 1996, Fontana and La Greca 1999a, Fontana and La Greca 1999b, Fontana and Massa 2000, Fontana and Ode 1999, Fontana et al. 1999, Galvagni 1995, Galvagni 2000, La Greca 1994, La Greca et al. 2000, Schmidt and Herrmann 2000, Schmidt 1996

Liechtenstein (LI): Denoth-Hasler 1995

Luxembourg (LU): Duijm and Kruseman 1983

Malta (MT): Baccetti 1973, Cassar 1990, Cilia 1975, Harz 1986, Schembri 1984, Schembri and Ebejer 1983, Schembri and Ebejer 1984

Netherlands (NL): Kleukers et al. 1997

Norway (NO): Holst 1986

Poland (PL): Bazyluk and Liana 2000

Portugal (PT): Grosso and Jose 2000, Lange 1990a, Lange 1990b, Lock 1999

Romania (RO): Kis and Vasiliu 1970

Slovenia (SI): Gomboc et al. 2000, Us 1992

Turkey (TR): Karabag 1958, Karabag 1964, Karabag et al. 1971, Naskrecki 1991

Yugoslavia (YU): Adamovic 1975, Cejchan 1981, Pavicevic and Karaman 2001
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Supplementary materials

**Suppl. material 1: Fauna Europaea Guidelines for Group Coordinators and Taxonomic Specialists**

Authors: Yde de Jong, Verner Michelsen, Nicolas Bailly
Data type: pdf
Filename: FaEu_Guidelines_v4.0.1.pdf - Download file (496.16 kb)

**Suppl. material 2: FaEu Orthopteroid stats**

Authors: Yde de Jong
Data type: pdf
Filename: FaEu_Orthopteroid_stats.png - Download file (679.23 kb)
Suppl. material 3: Orthopteroids — Fauna Europaea mapping

Authors: Yde de Jong and Klaus-Gerhard Heller (Fauna Europaea), Marilyn Beckman, David Eades, and Edward Dewalt (Orthoptera Species File), Paul Brock (Phasmida Species File), Heidi Hopkins (Dermaptera Species File), and Mike Maehr (Embioptera Species File).

Data type: xlsx

Brief description: Cross-validation of Fauna Europaea (version 2.6.2) and various Orthopteroid species data sets (version 5.0/5.0), including Orthoptera Species File (http://Orthoptera.SpeciesFile.org), Phasmida Species File (http://Phasmida.SpeciesFile.org), Dermaptera Species File (http://Dermaptera.SpeciesFile.org), and Embioptera Species File (http://Embioptera.SpeciesFile.org). For details on data ownership and correct citation please check the relevant websites.

Filename: Orthopteroids-FaEu_mapping_v4.xlsx - Download file (163.78 kb)