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## **Towards the new Checklist of the Italian Fauna**

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### **SUMMARY**

The Scientific Committee for the Italian Fauna is managing the new checklist of the animal species of Italy. The previous checklist was published in 1993-1995 and included both protozoans and Metazoa (more than 57,000 species); the new project, which includes only Metazoa, started in 2020 and is aimed at updating the former checklist (with more than 60,000 expected species) by on-line datasets and data papers. The new checklist includes marine species recorded in the Italian seas, divided into nine marine sectors, with the Italian Economic Exclusive Zone, and terrestrial and freshwater species recorded in administrative regions, as well as in the three macro-regions (northern continental, southern peninsular and insular - Sicily and Sardinia - macro-regions). Records from geopolitical units biogeographically

related to Italy (i.e., Canton Ticino, CH; Corsica, F; San Marino Republic and Vatican City) are also included. Over 180 Italian and foreign taxonomists have so far participated to the first phase of this new project, providing datasets for taxa at different hierarchical level, from phyla to subfamilies and tribes. The list is intended to be a fundamental instrument not only for the faunistic knowledge of Italy, but also for biodiversity conservation strategies in the country and in the European Union. The new Checklist of the Italian fauna will be available from the LifeWatch Italy platform, and it will be progressively updated. Furthermore, data papers for taxa at different hierarchical level could be published with continuity in a special section of the journal *Biogeographia – The Journal of Integrative Biogeography*.

## INTRODUCTION

The Scientific Committee for the Italian Fauna (Comitato Scientifico per la Fauna d'Italia, hereinafter referred to as CSFI), founded in 1952, manages the editorial project “Fauna d'Italia” (Fauna of Italy), promoting and coordinating the production of monographic volumes devoted to the taxonomy, biology and faunistics of marine, freshwater, and terrestrial Metazoa of Italy. From 1956 to 2021, 53 volumes (12 of which on vertebrates, 31 on insects) have been published, while other monographs are in preparation.

In 1991 a group of zoologists of CSFI launched the project Checklist of the Italian fauna, which eventually produced a complete inventory of the animal species occurring in the whole country – the first example in Europe (Minelli 1995, 1996, Minelli et al. 1999, Stoch et al. 2004). Under the encouragement of Alessandro Minelli (Padova University) and the late Sandro Ruffo (Natural History Museum of Verona), and with the financial support of the Nature Conservation Service of the Ministry for Environment, this ambitious project produced 110 issues listing 1,812 species of protozoans and 55,656 species of Metazoa (Minelli et al. 1993-1995). A team of 272 specialists from 15 countries was involved in the project. The Checklist of the Italian fauna represented the starting point for new databases at national level, mostly for conservation purposes, like the CKmap project – “Checklist and distribution of the Italian fauna” (Stoch 2003-2004, Minelli &

Stoch 2006, Ruffo & Stoch 2007) and others (e.g.: Trizzino et al. 2013; Stoch & Genovesi 2016, Relini 2018, 2010).

The idea of a complete update of the Checklist of the Italian fauna has been discussed within the CSFI since February 2015. In August 2017, during the 7<sup>th</sup> Conference of the Italian Society for Evolutionary Biology (Rome, Italy), some members of the CSFI organized the first meeting aimed at discussing the project of the new Checklist of the Italian fauna. The decision to involve the CSFI in such a hard challenge was approved by the whole CSFI in 2018 and in September 2019 a Steering Group of the project was defined (Marco A. Bologna, Lucio Bonato, Alessandro Minelli, Marco Oliverio, Marzio Zapparoli). The Steering Group was enlarged with two additional zoologists (Fabio Cianferoni, Fabio Stoch) thanks to the support by the Italian national node of the LifeWatch European Research Infrastructure Consortium (LifeWatch ERIC), a node of which CSFI is a member, which is also engaged in building the informatic infrastructure for the online version of the new checklist. The work of Fabio Cianferoni and Fabio Stoch was also partly funded by the National Research Council of Italy (CNR).

A large number of Italian and foreign specialists were invited to contribute. The enthusiastic answer to this call convinced the Steering Group of the feasibility of this challenging project.

The new Checklist of the Italian fauna aims to be a scientific, foundational contribution to update the knowledge on the animal diversity of Italy and a technical tool, the fundamental taxonomic backbone for any dataset employed in biodiversity conservation in Italy within the European Union.

The project's workplan is addressed at achieving two main different goals:

- (a) to produce the Checklist datasets of all metazoan taxa, with the structure described below; these datasets, will be accessible from the LifeWatch platform, and will be progressively updated with new records according to the specialists' availability and the progress of knowledge;
- (b) to publish data papers, each concerning one or more taxa, progressively published in a special section of *Biogeographia – The Journal of Integrative Biogeography*, titled *The new Checklist of the Italian Fauna*, each with a link to the relevant dataset(s) on the LifeWatch Italy platform.

The new Checklist of the Italian fauna will be available to all potential stakeholders, under a CC BY 4.0 license: specialists, students, amateurs, consultants, technicians, public administrators etc. The online material includes, for each taxon, the relevant metadata and the dynamic and updatable checklist. Data papers published in *Biogeographia* explain the methodology and structure of each list and include, as supplementary material, a summary file with the relevant species list of the checklist at the day of publication of the paper.

Funding for the new Checklist of the Italian fauna was obtained from the CSFI (which is financially supported also by Accademia Nazionale Italiana di Entomologia, and Unione Zoologica Italiana) and from LifeWatch Italy (which is financially supported by EU and National Research Council of Italy - CNR).

Up to now (February 2022), lists of different taxa for more than 27,600 species have been overall collected, and new lists are still being completed by other specialists and edited by the Steering Group. A total of more than 60,000 species of Metazoa is expected.

The current version of the new Checklist of the Italian fauna can be found online at <https://www.lifewatchitaly.eu/en/initiatives/checklist-fauna-italia-en/checklist/>. The dataset, along with all its metadata based on the EML2.2.0 standard, are published on the LifeWatch Italy Data Portal (currently at <https://dataportal.lifewatchitaly.eu/view/urn%3Aauuid%3Ac1f2ab37-61e4-48e9-b3a9-15bdbf002f9d>).

## STRUCTURE OF THE NEW CHECKLIST

The new Checklist of the Italian fauna includes all metazoan species known to occur in the wild in Italy. It will be continuously updated as new records are added or previous records are modified/deleted, and it is currently based on the last upload of each dataset on the LifeWatch Italy data Portal.

Each Checklist is organized in 62 fields. Taxa are ordered specifying phylum, class, order, family, and subfamily (if any). Authorship and year are specified for the names of each genus, subgenus (if any), species and subspecies (if any). Names are carefully checked for compliance with the International Code of Zoological Nomenclature (International Commission on Zoological Nomenclature 1999).

The structure of the new Checklist of the Italian fauna is simple, but somehow more detailed than in the first Checklist (Minelli et al. 1993-1995). Beside the taxonomic information, the following data are given for each species: a) endemic or alien status; b) for the non-marine animals, presence in each of the three macro-regions (continental, peninsular and insular Italy, Fig. 1) and, optionally, in administrative

regions (see point d); records from Sicily and Sardinia was kept mandatory, to allow an immediate comparison with the four Italian macro-regions used in the Checklist of Minelli et al. (1993-1995), i.e. North, South, Sicily, Sardinia; c) for the marine species, presence in each of the nine areas used in the checklist of the marine flora and fauna published by the Società Italiana di Biologia Marina (Relini 2008, 2010) and largely based on the biogeographic sectors identified by Bianchi (2004), including records from the Italian Economic Exclusive Zone (Fig. 1); d) for many taxa of terrestrial and freshwater animals, presence in each of the 20 Italian administrative regions, the Republic of San Marino and Vatican City; e) for many taxa, presence of the Italian species in Canton Ticino (Switzerland), Corsica (France) and Malta, all biogeographically related (but not politically belonging) to Italy; f) optional concise data on host species (for parasites) or breeding status (for birds); g) for many taxa, chorotype to which the individual species belong, as defined by Vigna Taglianti et al. (1992, 1999), amended for alien species with the area of origin; h) short taxonomic and distributional notes, if opportune, particularly when addressing comparisons with the previous checklist (Minelli et al. 1993-1995), and reference to relevant literature for species and subspecies of recent description or recorded in Italy after the publication of the previous checklists and its updates.

## STRUCTURE OF THE DATA PAPERS

Each data paper will be an independent contribution, with its DOI and its date of publication.

In each data paper, the description of the relevant dataset, with specific information relative to definitions and storage type for each of the 62 attribute fields of the dataset will be provided.

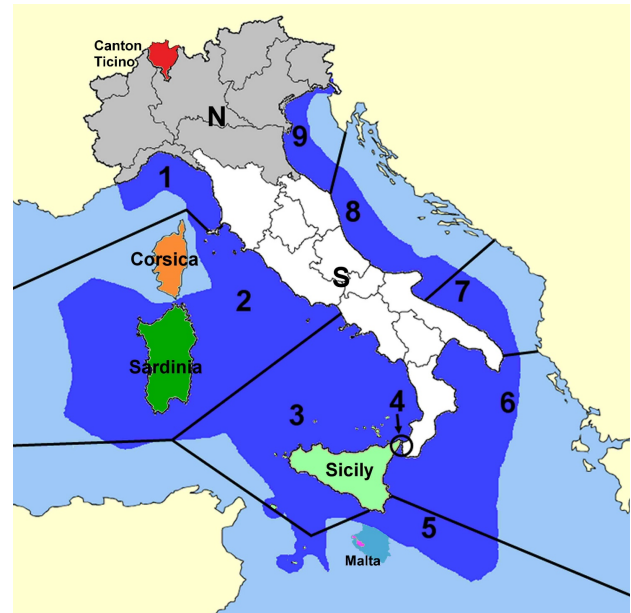


Figure 1. Geographical setting of the new Checklist of the Italian fauna. Terrestrial and freshwater sectors: **Canton Ticino** (*s.l.*, including Val Mesolcina, red); **N**, northern continental macro-region (gray); **S**, southern peninsular macro-region (white); island macro-region, divided in the previous checklist into **Sicily** (light green) and **Sardinia** (dark green); **Malta** (pink); **Corsica** (orange). Marine sectors, with the Italian Economic Exclusive Zone in blue: **1**, Ligurian Sea (*s.l.*); **2**, northern Tyrrhenian, including the sea around Corsica and Sardinia; **3**, southern Tyrrhenian, including the sea around northern and southern Sicily and Pantelleria Is.; **4**, Messina Strait; **5**, southern Mediterranean, including the sea around south-easternmost Sicily and the Pelagie Islands, and the continental shelf around Malta (turquoise); **6**, Ionian; **7**, southern Adriatic; **8**, mid-Adriatic; **9**, northern Adriatic.

The following minimal information is provided in the data papers (see each data paper for details):

Data set: *Object name; Characters encoding; Data set citation; Format name; Format version; Distribution (permanent link); Date of creation; Date of last revision; Date of publication; Update policy; Language; License of use; Metadata language; Metadata managers.*

Management details: *Project title; Database manager; Temporal coverage; Record basis; Funding grants.*

Geographic information: *General description; Geographic units; Bounding box; Sampling design; Habitat type; Biogeographic region; Countries; Quality control for geographic data.*

Literature records: *General description; Literature search methods; Literature list; Quality control for literature data.*

Taxonomic information: *General description; Taxonomic coverage; Taxonomic rank; Taxon specialists; Nomenclature; Taxonomic remarks; Quality control for taxonomic data.*

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