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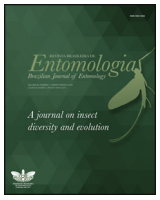

Checklists of Italian Neuropterida (Insecta) through the last three decades

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ABSTRACT

Italy was likely the first country in the world to have a complete list of all the species of animals known for its territory, thanks to the project 'Checklist delle Specie della Fauna d'Italia'. The project on the 'Updated Checklist of the Italian Fauna' started in 2020 and the process is now complete for the data on the superorder Neuropterida. In the period between the first and the most recent version of the checklist, the evolution of knowledge relating to the Italian territory was constantly updated every semester into the online repertoire edited by the author. Moreover an online English version within the "World Neuropterida Faunas" project was created and subsequently updated. This report discusses the thirty-year development of the overall and local knowledge of this group of insects in Italy, analyzing the strengths and shortcomings, together with the repercussions of the studies finalized for the protection and conservation of a territory within the Mediterranean area, a hotspot of world organic biodiversity.

Introduction

When the pioneering work carried out towards the end of the last century, achieved thanks to the project 'Checklist delle Specie della Fauna d'Italia' (Minelli et al., 1993-1995), the animal biodiversity of our country was one of the first in the world to be exhaustively listed, photographing the situation of that period; even the knowledge relating to the Italian Neuropteridae finally had an overall framework for the whole national territory (Bernardi Iori et al., 1995), cataloguing in a correct interpretation a scarce and very fragmentary number of faunal knowledge relating to this group of insects. That milestone faunal study has recently been updated and modernized by 'Updated Checklist of the Italian Fauna' started in 2020 by professors Bologna, Minelli et al., including the Neuropterida section (Bologna et al., 2022).

During the three decades between the first version of the Italian Neuropterida checklist and its recent update, the study of this group in Italy has undergone an acceleration and a huge change in visibility due to a combination of factors which the social media, the use of websites with an artificial intelligence approach and the widespread diffusion of a citizen science approach have concurred.

The aim of this contribution is to summarize the structure and the innovations present in the updated version of the Italian Neuropterida checklist, together with the main results related to the use of emerging information technologies and the participation of citizens in knowledge relating to these insects.

Material and methods

Main resources available between the two version of Checklist of Italian Neuropterida.

In the period between the first and the most recent version of the Checklist, the evolution of knowledge relating to the Italian territory was constantly updated every semester in an online repertoire visible at the URL http://neurotteri.casaccia.enea.it/ . Moreover, an online English version within the "World Neuropterida Faunas" (a project by John Oswald) was implemented and subsequently updated by me and Davide Badano (Letardi and Badano, 2017). A turning point in this period was the realization, in 2005, of the ckMap project (Letardi, 2005), with a modern graphic rendering of the fauna distribution, but with a still very limited number of data relating to our territory. In the quarter century between the first and second version of the checklist, an epochal revolution in the country was the explosion of citizen

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science and the participation of citizens in the discovery of nature (and also for Neuropterida) through social media. The production of the photographic atlas of the Italian Neuropterida in 2016 (Letardi, 2016) was the result of the collaboration between the few Italian specialists of this group of insects and a large audience of naturalists who shared their observations on the territory.

The consequence of greater attention and the development of knowledge relating to these insects has produced a marked increase in faunal studies both specifically dedicated to Neuropterida (carried out by a number of specialists that unfortunately remained rather limited) and dedicated to a broader survey of the biodiversity of specific areas. This made it possible to gradually enrich the faunal records.

Further increases for sharing faunal data about Italian Neuropterida are linked to specific surveys extracted from iNaturalist (https://www.inaturalist.org/), an online open community that allows to share observations to discuss, identify, and create research-quality citizen science data: "iNaturalist's identification model" provides initial suggestions, but other people in the iNaturalist community may suggest alternative identifications or confirm the observations.

The new Checklist of Italian Neuropterida

The main features of the checklist in its current version includes 40 fields (Table 1).

Data set information

Object name: The new Checklist of the Italian Fauna: Neuropterida

Characters encoding: Unicode (UTF-8)

Data set citation: Pantaleoni R.A. and Letardi A., 2021. Neuropterida. In: Bologna M.A., Zapparoli M., Oliverio M., Minelli A., Bonato L., Cianferoni F., Stoch F. (eds), The new Checklist of the Italian Fauna. Version 1.0. Last update: 2021-05-31.

Table 1
Description of the data set with specific information relative to definitions and storage type for each of the 40 fields of the data set.

Variable (field)	Description	Storage type
Phylum	Phylum name, Arthropoda for all records	string
Class	Class name, Insecta for all records	string
Order	Order name, according to Oswald (2007)	string
Family	Family name, according to Oswald (2007)	string
Genus	Valid genus name, followed the species names in the world checklist for Neuropterida (Oswald, 2007) and subsequent revisions	string
Genus authorship	Genus descriptor, reported according to the rules of the ICZN	string
Species	Valid species name, followed the species names in the world checklist for Neuropterida (Oswald, 2007) and subsequent revisions	string
Species authorship	Species descriptor, reported according to the rules of the ICZN	string
Subspecies	Valid subspecies name, followed the species names in the world checklist for Neuropterida (Oswald, 2007) and subsequent revisions	string
Subspecies authorship	Subspecies descriptor, reported according to the rules of the ICZN	string
Fauna Europaea (name)	Species name as reported in FaunaEuropaea (de Jong, 2016)	string
WoRMS (AphiaID)	Species AphiaID as reported in WoRMS	string
Endemic	Species known as endemic (Secretariat of the Convention on Biological Diversity, 2002)	binary
Alien	Species known as alien (Secretariat of the Convention on Biological Diversity, 2002)	binary
N	Occurrence of the taxon in Northern continental Italy (grouping: Friuli - Venezia Giulia, Veneto, Trentino - Alto Adige, Lombardia, Valle d'Aosta, Piemonte, Liguria, Emilia Romagna)	binary
S	Occurrence of the taxon in Southern continental Italy (grouping: Toscana, Marche, Umbria, Lazio, Abruzzo, Molise, Campania, Puglia, Basilicata, Calabria)	binary
Si	Occurrence of the taxon in Sicily	binary
Sa	Occurrence of the taxon in Sardinia	binary
Ao	Occurrence of the taxon in Valle d'Aosta	binary
Pi	Occurrence of the taxon in Piemonte	binary
Lo	Occurrence of the taxon in Lombardia	binary
VT	Occurrence of the taxon in Trentino - Alto Adige	binary
V	Occurrence of the taxon in Veneto	binary
FVG	Occurrence of the taxon in Friuli - Venezia Giulia	binary
Li	Occurrence of the taxon in Liguria	binary
ER	Occurrence of the taxon in Emilia Romagna	binary
To	Occurrence of the taxon in Toscana	binary
Ma	Occurrence of the taxon in Marche	binary
Um	Occurrence of the taxon in Umbria	binary
La	Occurrence of the taxon in Lazio	binary
Abr	Occurrence of the taxon in Abruzzo	binary
Mo	Occurrence of the taxon in Molise	binary
Cp	Occurrence of the taxon in Campania	binary
Pu	Occurrence of the taxon in Puglia	binary
Bas	Occurrence of the taxon in Basilicata	binary
Cal	Occurrence of the taxon in Calabria	binary
RSM	Occurrence of the taxon in Repubblica di San Marino	binary
CV	Occurrence of the taxon in Città del Vaticano	binary
Taxonomic notes	Nomenclatorial changes from the previous checklist of Bernardi Iori et al. (1995)	string
Distribution notes	Literature reference for the records in a geographical unit not reported in Bernardi Iori et al. (1995)	string

Format name: xml, Extensible Markup Language, for the online version at LifeWatch Italy.

Format version: 1.0

Distribution: https://dataportal.lifewatchitaly.eu /view/urn:uuid:c1f2ab37-61e4-48e9-b3a9-15bdbf002f9d

Date of creation: June 15th, 2020

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Metadata language: English

Metadata managers: Marco A. Bologna, Lucio Bonato, Fabio Cianferoni, Alessandro Minelli, Marco Oliverio, Fabio Stoch, Marzio Zapparoli & LifeWatch Italy

Management details

Project title: The new Checklist of the Italian Fauna: Neuropterida

Database manager: Pantaleoni R.A.; Letardi A.; Marco A. Bologna, Lucio Bonato, Fabio Cianferoni, Alessandro Minelli, Marco Oliverio, Fabio Stoch, Marzio Zapparoli & LifeWatch Italy

Temporal coverage: Anything published until 15 June 2020.

Record basis: Published records in the scientific and grey literature.

Funding grants: No funding was specifically available for the project on Neuropterida; funding for the update of the Checklist of the Italian fauna was obtained from LifeWatch Italy.

Geographic information

General description: The data set includes records from the national territories of Italy, including the two major islands Sardinia and Sicily, and archipelagos and minor islands politically under the Italian legislation.

Geographic units: The geographical units within the Italian national territories for terrestrial records refer to the administrative boundaries of the 20 Italian regions, in addition to San Marino Republic and Vatican City. Continental Italy was also divided in two units, namely North (Friuli - Venezia Giulia, Veneto, Trentino - Alto Adige, Lombardia, Valle d'Aosta, Piemonte, Liguria, Emilia Romagna) and South (Toscana, Marche, Umbria, Lazio, Abruzzo, Molise, Campania, Puglia, Basilicata, Calabria).

Bounding box: All areas falling under Italian administration (in addition to San Marino Republic and Vatican City) from 35° 25' to 47° 06' N and from 6° 35' to 19° 20' E (WGS84 reference system) were included.

Sampling design: We did not perform any additional sampling to collect records of lacewing and their allies, but we used published data or verified personal communications.

Biogeographic region: Within the Palearctic region, according to the definitions of the European Environmental Agency (2017), the data set covers three European biogeographical regions: Alpine, Continental, and Mediterranean.

Countries: Italy, San Marino, Vatican City.

Quality control for geographic data: We checked that the georeferenced records and the published localities in the papers indeed matched the geographical units used for the checklist at the level of administrative regions.

Taxonomic information

General description: Only records reporting species or subspecies were included, disregarding records at higher levels like genus, family, etc.

Taxonomic coverage: Super order Neuropterida, intended in its traditional inclusion of Neuroptera, Raphidioptera, and Megaloptera (Bernardi Iori et al., 1995).

Taxon specialists: Roberto A. Pantaleoni and Agostino Letardi.

Nomenclature: The adopted nomenclature followed the species names in the world checklist for Neuropterida (Oswald, 2007) and subsequent revisions. Species authorships follow the rules of art. 51.3 of the 4th edition of the International Code of Zoological Nomenclature (International Commission on Zoological Nomenclature, 1999) for the use of parentheses.

Taxonomic remarks: Any taxonomic change that occurred since the publication of the previous checklist (Bernardi Iori et al., 1995) is mentioned, according to the updated nomenclature of the Neuropterida.

Quality control for taxonomic data: Taxonomic data were checked and updated to include revision of names, synonyms, delimitation of genera and higher taxa, all conducted through a comparison with the world checklist for Neuropterida (Oswald, 2007) and subsequent revisions.

Results and discussion

The checklist updated to 2020 records the advancement of knowledge relating to the Italian fauna of the Neuropterida, which took place the last quarter of century.

This substantial increase in knowledge is not only the product of a number of faunal studies carried out by that small number of entomologists who study this "oligodiverse group" of insects in Italy (for a constant update of the actual scientific works in this country, refer to the bibliographic list available at the URL http://neurotteri.casaccia.enea.it/bibliografia.htm). The emergence of new IT tools, the constant collaboration of Italian entomologists specializing in Neuropterida in naturalistic forums and social media, and the increasing collaboration, national and international, in scientific projects of fauna studies and citizen science, are main factors behind this advancement in knowledge. If the checklist published in 1995 represented the systematization of previous knowledge almost exclusively due to professional entomologists, the picture, which we can reasonably consider very close to the real situation of the Italian biodiversity of Neuropterida, is the result of a careful and critical collaboration between specialists and a large number of passionate amateurs.

The comparison data presented (Table 2) provide a summary numerical comparison of this long and careful collaborative work. The consistent numerical increase of the taxa of the Chrysopidae family is due to a greater definition reached in recent years of the complex of sibling species previously considered as *Chrysoperla* gr. *carnea*; thus, there are other groups of species that will have a similar increases, in the near future, the biodiversity of Italian Neuropteridae (again in Chrysopidae, the probable complexes of species currently defined as *Apertochrysa* gr. *prasina* and *A.* gr. *flavifrons*, and in the Myrmeleontidae the revision of the genus *Creoleon* Tillyard, 1918 which could increase the number of taxa present in Italy).

Table 2
Comparison of the numerical consistency of Neuropterida taxa for families present in the Italian territory.

Families	1995	2020
Sialidae	4	4
Raphidiidae	18	21
Inocelliidae	2	3
Coniopterygidae	21	24
Osmylidae	1	1
Nevrorthidae	2	3
Sisyridae	3	4
Berothidae	1	2
Mantispidae	3	3
Dilaridae	2	3
Hemerobiidae	44	45
Chrysopidae	38	44
Myrmeleontidae	30	32
Ascalaphidae	8	10
Taxa	177	199

Finally, it is possible that the minor detected family of dustywings (Coniopterygidae) may in the near future increase in the number of taxa recorded for Italy. The list of Neuropterida species currently reported for the Italian territory is detailed in Table 3.

Table 3
List of Neuropterida (Megaloptera, Raphidioptera, and Neuroptera) species currently reported for the Italian territory.

Families	Genera	Species	Describer
Sialidae			
	Sialis Latreille, 1803	*fuliginosa*	Pictet, 1836
		lutaria	(Linnaeus, 1758)
		morio	Klingstedt, 1932
		nigripes	Pictet, 1865
Raphidiidae			
	Phaeostigma Navás, 1909	*galloitalicum*	(H. Aspöck & U. Aspöck, 1976)
		italogallicum	(H. Aspöck & U. Aspöck, 1976)
		notatum	(Fabricius, 1781)
		grandii	(Principi, 1960)
	Dichrostigma Navás, 1909	*flavipes*	(Stein, 1863)
	Tjederiraphidia H. Aspöck, U. Aspöck & Rausch, 1985	*santuzza*	(H. Aspöck, U. Aspöck & Rausch, 1980)
	Subilla Navás, 1916	*confinis*	(Stephens, 1836)
		principiae	Pantaleoni, U. Aspöck, Cao, H. Aspöck, 2004
	Ornatoraphidia H. Aspöck & U. Aspöck, 1968	*flavilabris*	(A. Costa, 1855)
	Turcoraphidia H. Aspöck & U. Aspöck, 1968	*amara*	(H. Aspöck & U. Aspöck, 1964)
	Xanthostigma Navás, 1909	*xanthostigma*	(Schummel, 1832)
		aloysianum	(A. Costa, 1855)
		corsicum	(Hagen, 1867)
	Raphidia Linnaeus, 1758	*ophiopsis*	Linnaeus, 1758
		mediterranea	H. Aspöck, U. Aspöck & Rausch, 1977
		ligurica	Albarda, 1891
		ulrike	H. Aspöck, 1964
	Italoraphidia H. Aspöck & U. Aspöck, 1968	*solariana*	(Navás, 1915)
	Puncha Navás, 1915	*ratzeburgi*	(Brauer, 1876)
	Calabroraphidia Rausch, Aspöck H. & Aspöck U, 2004	*renate*	Rausch, Aspöck H. & Aspöck U, 2004
	Venustoraphidia H. Aspöck & U. Aspöck, 1968	*nigricollis*	(Albarda, 1891)
Inocelliidae			
	Fibla Navás, 1915	*maclachlani*	(Albarda, 1891)
	Parainocellia H. Aspöck & U. Aspöck, 1968	*bicolor*	(A. Costa, 1855)
	Inocellia Schneider, 1843	*crassicornis*	(Schummel, 1832)
Coniopterygidae			
	Aleuropteryx Low, 1885	*juniperi*	Ohm, 1968
		loewii	Klapalek, 1894
	Conwentzia Enderlein, 1905	*psociformis*	(Curtis, 1834)
		pineticola	Enderlein, 1905
	Hemisemidalis Meinander, 1972	*pallida*	(Withycombe, 1924)
	Semidalis Enderlein, 1905	*aleyrodiformis*	Stephens, 1836
		pseudouncinata	Meinander, 1963
		vicina	(Hagen, 1861)
	Helicoconis Enderlein, 1905	*hispanica*	Ohm, 1965
		hirtinervis	Tjeder, 1960
		lutea	(Wallengren, 1871)
		interna	Navás, 1911
	Coniopteryx Curtis, 1834	*borealis*	Tjeder, 1930
		pygmaea	Enderlein, 1906
		tineiformis	Curtis, 1834
		drammonti	Rousset, 1964
		haematica	McLachlan, 1868
		renate	Rausch & H. Aspöck, 1977
		arcuata	Kis, 1965
		esbenpeterseni	Tjeder, 1930
		lentiae	H. Aspöck & U. Aspöck, 1964
		tjederi	Kimmins, 1934
		loipetsederi	H. Aspöck, 1963
	Parasemidalis Enderlein, 1905	*fuscipennis*	(Reuter, 1894)
Osmylidae			
	Osmylus Latreille, 1802	*fulvicephalus*	(Scopoli, 1763)
Nevrorthidae			
	Nevrorthus A. Costa, 1863	*apatelios*	H. Aspöck, U. Aspöck & Hölzel, 1977
		fallax	(Rambur, 1842)
		iridipennis	A. Costa, 1863

Table 3
Continued...

Families	Genera	Species	Describer
Sisyridae			
	Sisyra Burmeister, 1839	*dalii*	McLachlan, 1866
		iridipennis	A. Costa, 1884
		nigra	(Retzius, 1783)
		terminalis	Curtis, 1854
Berothidae			
	Isoscelipteron A. Costa, 1863	*fulvum*	A. Costa, 1863
		glaserellum	(U. Aspöck, H. Aspöck & Hölzel, 1979)
Mantispidae			
	Mantispa Illiger in Kugelann, 1798	*aphavexelte*	U. Aspöck & H. Aspöck, 1994
		perla	Pallas, 1772
		styriaca	(Poda, 1761)
Dilaridae			
	Dilar Rambur, 1838	*corsicus*	Navás, 1909
		duelli	U. Aspöck & H. Aspöck, 1995
		parthenopaeus	A. Costa, 1855
Hemerobiidae			
	Drepanepteryx Leach in Brewster, 1815	*algida*	(Erichson in Middendorff, 1851)
		phalaenoides	(Linnaeus, 1758)
	Megalomus Rambur, 1842	*hirtus*	(Linnaeus, 1761)
		pyraloides	Rambur, 1842
		tineoides	Rambur, 1842
		tortricoides	Rambur, 1842
	Wesmaelius Krüger, 1922	*concinnus*	(Stephens, 1836)
		quadrifasciatus	(Reuter, 1894)
		cunctatus	(Ohm, 1967)
		fassnidgei	(Killington, 1933)
		helveticus	(H. Aspöck & U. Aspöck, 1964)
		malladai	(Navás, 1925)
		mortoni	(McLachlan, 1899)
		nervosus	(Fabricius, 1793)
		ravus	(Withcombe, 1923)
		subnebulosus	(Stephens, 1836)
		tjederi	(Kimmins, 1963)
	Hemerobius Linnaeus, 1758	*atrifrons*	McLachlan, 1868
		contumax	Tjeder, 1932
		fenestratus	Tjeder, 1932
		gilvus	Stein, 1863
		handschini	Tjeder, 1957
		humulinus	Linnaeus, 1758
		lutescens	Fabricius, 1793
		micans	Olivier, 1792
		nitidulus	Fabricius, 1777
		perelegans	Stephens, 1836
		pini	Stephens, 1836
		schedli	Hölzel, 1970
		simulans	Walker, 1853
		stigma	Stephens, 1836
		marginatus	Stephens, 1836
	Micromus Rambur, 1842	*angulatus*	(Stephens, 1836)
		lanosus	(Zeleny, 1962)
		paganus	(Linnaeus, 1767)
		variegatus	(Fabricius, 1793)
	Psectra Hagen, 1866	*diptera*	(Burmeister, 1839)
	Sympherobius Banks, 1904	*elegans*	(Stephens, 1836)
		fallax	Navás, 1908
		luqueti	Leraut, 1991
		pygmaeus	(Rambur, 1842)
		fuscescens	(Wallengren, 1863)
		klapaleki	Zeleny, 1963
		pellucidus	(Walker, 1853)
		riudori	Navás, 1915

Table 3
Continued...

Families	Genera	Species	Describer
Chrysopidae			
	Hypochrysa Hagen, 1866	*elegans*	(Burmeister, 1839)
	Nothochrysa McLachlan, 1868	*capitata*	(Fabricius, 1793)
		fulviceps	(Stephens, 1836)
	Italochrysa Principi, 1946	*italica*	(Rossi, 1790)
	Nineta Navás, 1912	*carinthiaca*	(Hölzel, 1965)
		flava	(Scopoli, 1763)
		inpunctata	(Reuter, 1894)
		pallida	(Schneider, 1846)
		principiae	Monserrat, 1980
		vittata	(Wesmael, 1841)
	Chrysopidia Navás, 1911	*ciliata*	(Wesmael, 1841)
	Chrysopa Leach in Brewster, 1815	*abbreviata*	Curtis, 1834
		dorsalis	Burmeister, 1839
		formosa	Brauer, 1850
		nigricostata	Brauer, 1850
		pallens	Rambur, 1838
		perla	(Linnaeus, 1758)
		phyllochroma	Wesmael, 1841
		viridana	Schneider, 1845
		walkeri	McLachlan, 1893
	Chrysoperla Steinmann, 1964	*agilis*	Henry, Brooks, Duelli & Johnson, 2003
		carnea	(Stephens, 1836)
		europaea	Canard & Thierry, 2020
		lucasina	(Lacroix, 1912)
		mediterranea	(Hölzel, 1972)
		pallida	Henry, Brooks, Duelli & Johnson, 2002
	Peyerimhoffina Lacroix, 1920	*gracilis*	(Schneider, 1851)
	Cunctochrysa Hölzel, 1970	*albolineata*	(Killington, 1935)
		baetica	(Hölzel, 1972)
		cosmia	Navás, 1918
	Pseudomallada Tsukaguchi, 1995	*abdominalis*	(Brauer, 1856)
		clathratus	(Schneider, 1845)
		flavifrons	(Brauer, 1850)
		genei	(Rambur, 1842)
		ibericus	(Navás, 1903)
		inornatus	(Navás, 1901)
		picteti	(McLachlan, 1880)
		prasinus	(Burmeister, 1839)
		ventralis	(Curtis, 1834)
		venustus	(Hölzel, 1974)
		zelleri	(Schneider, 1851)
	Rexa Navás, 1919	*corsica*	(Hagen, 1864)
	Brinckochrysa Tjeder, 1966	*chlorosoma*	(Navás, 1914)
		nachoi	Monserrat, 1977
Myrmeleontidae			
	Dendroleon Brauer, 1866	*pantherinus*	(Fabricius, 1787)
	Acanthaclisis Rambur, 1842	*occitanica*	(Villers, 1789)
	Synclisis Rambur, 1842	*baetica*	(Rambur, 1842)
	Myrmecaelurus A. Costa, 1855	*trigrammus*	(Pallas, 1771)
	Cueta Navás, 1911	*lineosa*	(Rambur, 1842)
	Myrmeleon Linnaeus, 1767	*bore*	(Tjeder, 1941)
		formicarius	Linnaeus, 1767
		gerlindae	Hölzel, 1974
		hyalinus	Olivier, 1811
		inconspicuus	Rambur, 1842
		mariaemathildae	Pantaleoni, Cesaroni & Nicoli Aldini, 2010
		punicanus	Pantaleoni & Badano, 2012
	Euroleon Esben-Petersen, 1918	*nostras*	(Geoffroy in Fourcroy, 1785)
	Macronemurus A. Costa, 1855	*appendiculatus*	(Latreille, 1807)
	Neuroleon Navás, 1909	*arenarius*	(Navás, 1904)
		egenus	(Navás, 1915)
		microstenus	(McLachlan, 1898)
		nemausiensis	(Borkhausen, 1791)

Table 3
Continued...

Families	Genera	Species	Describer
		ochreatus	(Navás, 1904)
	Distoleon Banks, 1810	*annulatus*	(Klug, 1834)
		tetragrammicus	(Fabricius, 1798)
	Nemoleon Navás, 1909	*notatus*	(Rambur, 1842)
		poecilopterus	(Stein, 1863)
	Creoleon Tillyard, 1918	*aegyptiacus*	(Rambur, 1842)
		corsicus	(Hagen, 1860)
		griseus	(Klug, 1834)
		lugdunensis	(Villers, 1789)
		plumbeus	(Olivier, 1811)
	Gymnocnemia Schneider, 1845	*variegata*	(Schneider, 1845)
	Megistopus Rambur, 1842	*flavicornis*	(Rossi, 1790)
		lucasi	(Navás, 1912)
	Palpares Rambur, 1842	*libelluloides*	(Linnaeus, 1764)
Ascalaphidae			
	Ascalaphus (Fabricius, 1775)	*festivus*	(Rambur, 1842)
	Bubopsis McLachlan, 1898	*agrionoides*	(Rambur, 1838)
	Deleproctophylla Lefèbvre, 1842	*australis*	(Fabricius, 1787)
	Libelloides Schaffer, 1763	*coccajus*	Denis & Schiffermüller, 1775
		corsicus	Rambur, 1842
		lacteus	(Brullé, 1832)
		latinus	(Lefèbvre, 1842)
		longicornis	(Scopoli, 1763)
		macaronius	(Scopoli, 1763)
		siculus	Angelini, 1827

Figure 1 Title page of the project "European Neuropterida" on iNaturalist web page (https://www.inaturalist.org/projects/european-neuropterida).

Figure 2 Distribution in the Italian territory of the data validated so far in the "European Neuropterida" project.

Conclusion

The collaboration between active citizens and professional entomologists specialized in the study of Neuropterida is an example of how "citizen science" can have an important impact on the knowledge of biodiversity in the Italian territory. This collaboration has its most recent and promising development in a project specifically implemented in the iNaturalist web platform "European Neuropterida" (https://www.inaturalist.org/projects/european-neuropterida), which sees the contribution of several hundred active citizens (Figs. 1 and 2), in the awareness that only thanks to this fruitful interaction and integration of knowledge, we you can really get close to a complete picture of the biological richness of a territory.

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Conflicts of interest

The author declares no conflicts of interest.

References

Bernardi Iori, A., Kathirithamby, J., Letardi, A., Pantaleoni, R.A., Principi, M.M., 1995. Neuropteroidea (Megaloptera, Raphidioptera, Planipennia), Mecoptera, Siphonaptera, Strepsiptera. In: Minelli, A., Ruffo, S., La Posta, S. (Eds.), Checklist Delle Specie Della Fauna Italiana. Calderini Editore, Bologna.

Bologna, M.A., Bonato, L., Cianferoni, F., Minelli, A., Oliverio, M., Stoch, F., Zapparoli, M., 2022. Towards the new Checklist of the Italian fauna. Biogeographia. J. Integr. Biog 37, ucl001. https://doi.org/10.21426/B637156271.

de Jong, Y., 2016. Fauna Europaea. Fauna Europaea Consortium. Checklist dataset. https://doi.org/10.15468/ymk1bx.

European Environmental Agency, 2017. Biogeographical Regions in Europe. European Topic Centre on Biological Diversity (ETC/BD). Available in: https://www.eea.europa.eu/data-and-maps/figures/biogeographical-regions-in-europe-2 (accessed 23 May 2021).

International Commission on Zoological Nomenclature, 1999. International Code of Zoological Nomenclature, 4th ed. The International Trust for Zoological Nomenclature, London. Available in: https://www.iczn.org/the-code/the-international-code-of-zoological-nomenclature/the-code-online/ (accessed 23 May 2021).

Letardi, A., 2005. Insecta Neuroptera, Megaloptera e Raphidioptera. In: Ruffo, S., Stoch, F. (Eds.), Checklist e Distribuzione Della Fauna Italiana, Ministero dell'Ambiente e della Tutela del Territorio, Italy, pp. 235–236 (Memorie del Museo Civico di Storia Naturale di Verona, 2 serie, Sezione Scienze della Vita 16).

Letardi, A. (Ed.), 2016. Atlante dei Neuropterida Della Fauna Italiana. Edizioni ENEA, Milano.

Letardi, A., Badano, D., 2017. Neuropterida of Italy. Lacewing Digital Library (Research Publication, 3) [first LDL version: 2017.01.31]

Minelli, A., Ruffo, S., La Posta, S. (Eds.), 1993-1995. La Checklist Delle Specie Della Fauna d'Italia. In: Ruffo, S., Stoch, F. (Eds.), Checklist e Distribuzione Della Fauna Italiana. Comitato Scientifico per la Fauna d'Italia, Ministero dell'Ambiente, Calderini Editore, Italy.

Oswald, J.D., 2007. Neuropterida Species of the World. Lacewing Digital Library (Research Publication, 1). [first LDL version: 2007.10.31]

Secretariat of the Convention on Biological Diversity, 2002. Decision VI/23: Alien Species that Threaten Ecosystems, Habitats and Species. Convention on Biological Diversity Secretariat, Montreal, Canada. Document UNEP/CBD/COP/6/23. Available in: https://www.cbd.int/decision/cop/?id=7197(accessed 23 May 2021).