Biogeographia – The Journal of Integrative Biogeography 37 (2022): ucl004
https://doi.org/10.21426/B637156807
Special Section: The new Checklist of the Italian Fauna

The new Checklist of the Italian Fauna: Rotifera

DIEGO FONTANETO [1] *, ISABELLA BERTANI [2], TOMMASO CANCELLARIO [3, 4], GIAMPAOLO ROSSETTI [5], ULRIKE OBERTEGGER [6]

[1] *Water Research Institute (IRSA), National Research Council of Italy (CNR), Largo Tonolli 50, I-28922 Verbania Pallanza (Italy)*

[2] *University of Maryland Center for Environmental Science, 410 Severn Avenue, Annapolis, 21403 MD (USA)*

[3] *University of Navarra, Faculty of Sciences, Department of Environmental Biology, Campus Universitario, E-31008 Pamplona (Spain)*

[4] *Institute of Biodiversity and Environment, E-31080 Pamplona (Spain)*

[5] *Università degli Studi di Parma, Dipartimento di Scienze Chimiche, della Vita e della Sostenibilità Ambientale, Parco Area delle Scienze, 11/a – I-43124 Parma (Italy)*

[6] *Fondazione Edmund Mach (FEM), Research and Innovation Centre, Sustainable Agro-ecosystems and Bioresources Department, Research Group Hydrobiology, Via E. Mach 2, I-38010 S. Michele all'Adige TN (Italy)*

** corresponding author, email: diego.fontaneto@cnr.it*

Keywords: rotifer, Bdelloidea, Monogononta, Seisonacea, biodiversity, freshwater, limno-terrestrial, marine, species list

SUMMARY

We present a data set reporting the checklist of the species of the phylum Rotifera for Italy, updating the one previously published in the series 'Checklist delle Specie della Fauna d'Italia' in 1995. The records of the updated checklist refer to the 483 taxa at the species and subspecies level currently known from national Italian territories (119 Bdelloidea, 362 Monogononta, 2 Seisonacea) at the regional level (22 terrestrial and nine marine geographical units). The records refer to various freshwater, limno-terrestrial, and marine coastal habitats. The previous checklist reported 245 taxa (54 Bdelloidea, 189 Monogononta, 2 Seisonacea): three taxa were removed because currently considered not valid and 241 were added,

scanning 21 papers we found that were published between 1993 and 2020, expanding the regional records and including four papers older than 1993 with overlooked records in the previous checklist. The Rotifera data are part of the updated Checklist of the Italian Fauna, which is viewable on the LifeWatch Italy platform at https://www.lifewatchitaly.eu/en/initiatives/checklist-fauna-italia-en/checklist and is freely available on the LifeWatch Italy Data Portal (https://dataportal.lifewatchitaly.eu/data). The checklist will be dynamically updated with new records; this paper describes the state of the art of the data set regarding Rotifera on May 2021.

INTRODUCTION

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' (Minelli et al. 1993-1995). The aim of this data paper is to provide information on the updated checklist, within the project for a new checklist of the Italian fauna started in 2018 (Bologna et al. 2022), limited to the phylum Rotifera, with the description of the state of the art of the updated data as it currently stands in May 2021. The data described in this data paper will be progressively updated on the LifeWatch Italy Data Portal under the new 'Checklist of the Italian fauna', allowing for a dynamically updated knowledge on the occurrence of the fauna in the country (Bologna et al. 2022).

The phylum Rotifera is composed of about 2,000 species of microscopic animals (Fig. 1) living in any type of water, including freshwater and marine environments, and limno-terrestrial habitats such as mosses, lichens, and soil (Fontaneto & De Smet 2015). Rotifers are here considered in their traditional meaning, without the inclusion of Acanthocephala, a group of obligate parasites, which is known to be phylogenetically included within Rotifera, but with different morphology, body size, and ecology, as suggested by Fontaneto & Plewka (2021).

Rotifers are peculiar animals due to their desiccation capabilities, cyclical and obligate parthenogenesis, and potential for massive horizontal gene transfer in bdelloid rotifers (Fontaneto & De Smet 2015). They have also been considered not relevant for biogeography given that most species have a very wide distribution (Dumont 1983). Here we report the currently biogeographical knowledge for the known species of rotifers in Italy.

RESULTS

Summary statistics

The checklist of Rotifera accounts to 483 taxa at the species and subspecies level, with 119 taxa of Bdelloidea, 362 of Monogononta, and 2 of Seisonacea. The previous checklist (Braioni & Ricci 1995) reported 245 taxa: 54 Bdelloidea, 189 Monogononta, 2 Seisonacea. The current update includes 241 more taxa, mostly added since 1995. Three taxa listed in Braioni & Ricci (1995) were removed because currently considered not valid.

Northern Italy, with 429 species, has a higher number of known speciesis much better known than Southern Italy, with only 219 species. The regions with the highest number of known species are Piemonte (198), Emilia Romagna (188) and Lombardia (185), whereas for five regions (Valle d'Aosta, Marche, Abruzzo, Molise, Basilicata) no species are known. No species are known either for San Marino Republic or Vatican City (Fig. 2).

The marine areas with most species are M2 (Northern Tyrrhenian Sea) with 58 species and M9 (Northern Adriatic Sea) with 45; all marine areas have some records for rotifers (Fig. 2).

Data set description

The data were structured according to the Data Scheme of the LifeWatch Italy Data Portal, which is based on Darwin Core standard (Wieczorek et al. 2012) and controlled vocabularies (http://ecoportal.lifewatch.eu).

The first eight columns refer to the taxonomic ranks from phylum to family, followed by genus and genus authorship, species and species authorship, or eventually, when existing, subspecies and subspecies authorship (Table 1).

Two columns (Table 1) report whether the species is currently known to be endemic to Italy and whether it is a recent alien introduction, according to the definition of the Secretariat of the Convention on Biological Diversity (2002).

The following 33 columns (Table 1) are related to the occurrence of each taxon and report the known occurrence of rotifers in different geographical areas (Fig. 2): in terrestrial areas, according to the administrative Regions of the country (ISO 3166-2:IT), including San Marino and Vatican City; in marine Italian areas, according to the biogeographical divisions identified by the Società Italiana di Biologia Marina, SIBM (Relini 2008, 2010).

The two final columns (Table 1) report the nomenclatorial changes that occurred since the publication of the previous checklist by Braioni & Ricci (1995) and the literature reference used to expand the species list and the distribution of the species since Braioni & Ricci (1995).

Further details on the column and column headers of the data set (data table attributes) for the Rotifera part of the Checklist, with the corresponding definitions, are reported in the new 'Checklist of the Italian fauna' metadata record published on the LifeWatch Italy Data Portal (https://dataportal.lifewatchitaly.eu/view/urn%3Auuid%3Ac1f2ab37-61e4-48e9-b3a9-15bdbf002f9d).

A simplified version of the checklist is given in Supplementary File S1.

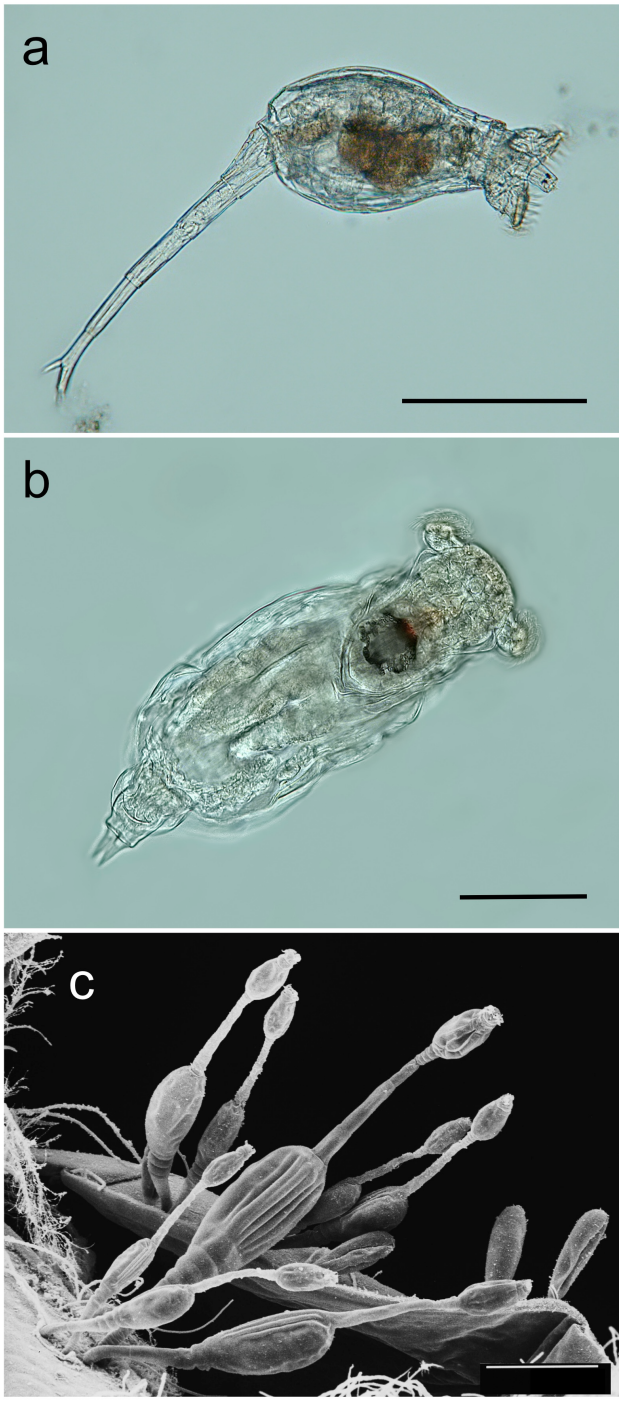
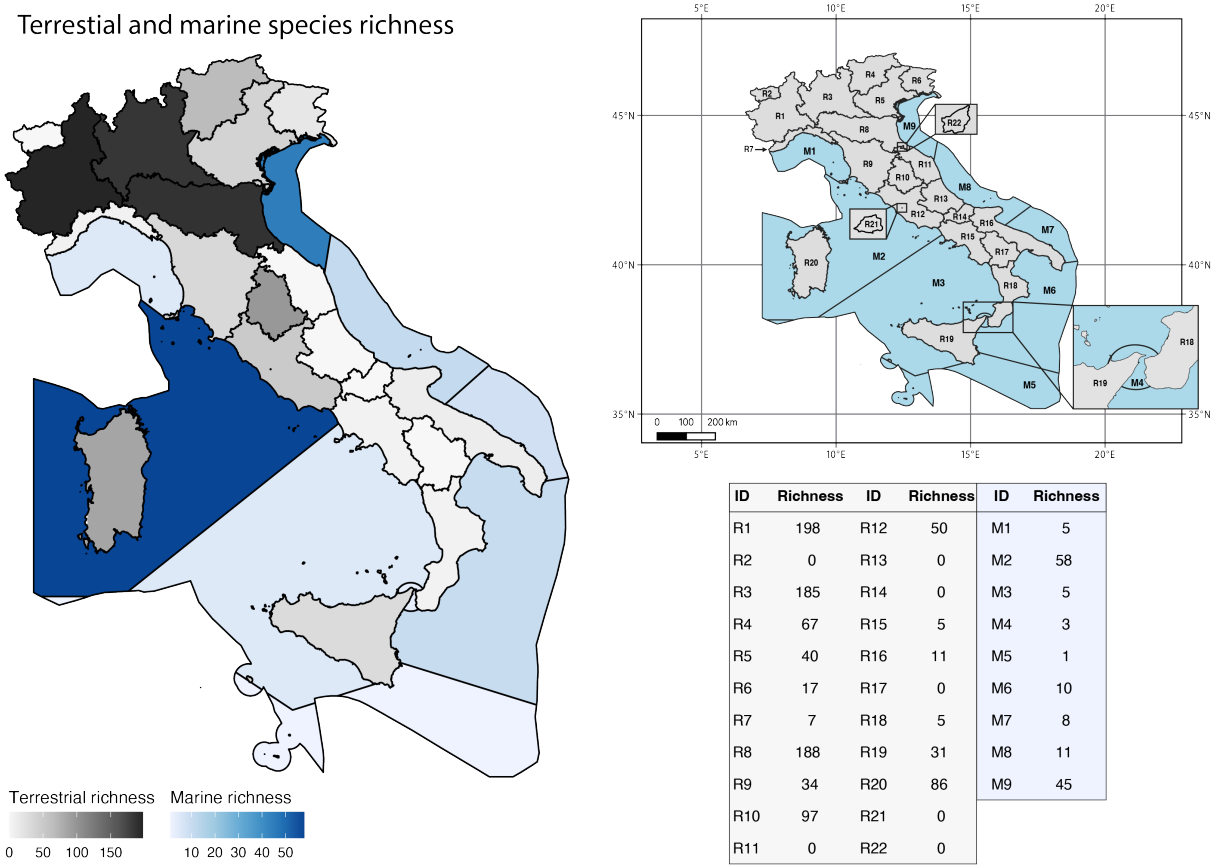


Figure 1. Images of representative rotifers: a) the bdelloid *Rotaria macrura* (Ehrenberg, 1832), b) the monogonont *Notommata aurita* (Müller, 1786), the seisonacean *Seison nebaliae* Grube, 1859. Scale bar = 0.1 mm (a, b), 0.2 mm (c). Photo courtesy of Michael Plewka (a, b) and Giulio Melone (c).

Table 1. Description of the data set with information relative to definitions and storage type of values for each of the 45 columns of the data set for Rotifera, as reported in the metadata information of Lifewatch Italy, https://dataportal.lifewatchitaly.eu/view/urn%3Auuid%3Ac1f2ab37-61e4-48e9-b3a9-15bdbf002f9d.

Variable (column)	Code	Description	Value
phylum		Phylum name, Rotifera for all records	string
class		Class name, either Bdelloidea, Monogononta, or Seisonacea	string
order		Order name, according to Fontaneto & De Smet (2015)	string
family		Family name, according to Segers (2002)	string
genus		Valid genus name, used according to the list of available names (LAN) for phylum Rotifera	string
genusAuthorship		Genus descriptor, reported according to the rules of the ICZN	string
scientificName		Valid species or subspecies name, used according to the list of available names (LAN) for phylum Rotifera	string
scientificNameAuthorship		Species or subspecies descriptor, reported according to the rules of the ICZN	string
endemisms		Species known as endemic, not endemic, subendemic, or questionable	string
establishmentMeans		Species known as native or introduced	string
Continental_Italy	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)	yes, no, maybe
Peninsular_Italy	S	Occurrence of the taxon in Southern continental Italy (grouping: Toscana, Marche, Umbria, Lazio, Abruzzo, Molise, Campania, Puglia, Basilicata, Calabria)	yes, no, maybe
Piemonte	R1	Occurrence of the taxon in Piemonte	yes, no, maybe
Valle_d'Aosta	R2	Occurrence of the taxon in Valle d'Aosta	yes, no, maybe
Lombardia	R3	Occurrence of the taxon in Lombardia	yes, no, maybe
Trentino_Alto_Adige	R4	Occurrence of the taxon in Trentino – Alto Adige	yes, no, maybe
Veneto	R5	Occurrence of the taxon in Veneto	yes, no, maybe
Friuli_Venezia_Giulia	R6	Occurrence of the taxon in Friuli – Venezia Giulia	yes, no, maybe
Liguria	R7	Occurrence of the taxon in Liguria	yes, no, maybe
Emilia_Romagna	R8	Occurrence of the taxon in Emilia Romagna	yes, no, maybe
Toscana	R9	Occurrence of the taxon in Toscana	yes, no, maybe
Umbria	R10	Occurrence of the taxon in Umbria	yes, no, maybe
Marche	R11	Occurrence of the taxon in Marche	yes, no, maybe
Lazio	R12	Occurrence of the taxon in Lazio	yes, no, maybe
Abruzzo	R13	Occurrence of the taxon in Abruzzo	yes, no, maybe
Molise	R14	Occurrence of the taxon in Molise	yes, no, maybe
Campania	R15	Occurrence of the taxon in Campania	yes, no, maybe
Puglia	R16	Occurrence of the taxon in Puglia	yes, no, maybe
Basilicata	R17	Occurrence of the taxon in Basilicata	yes, no, maybe
Calabria	R18	Occurrence of the taxon in Calabria	yes, no, maybe
Sicilia	R19	Occurrence of the taxon in Sicilia	yes, no, maybe
Sardegna	R20	Occurrence of the taxon in Sardegna	yes, no, maybe
Città_del_Vaticano	R21	Occurrence of the taxon in Città del Vaticano	yes, no, maybe
San_Marino	R22	Occurrence of the taxon in Repubblica di San Marino	yes, no, maybe
Ligurian_Sea	M1	Marine area number 1 according to SIBM: Ligurian Sea North of Piombino and Capo Corso	yes, no, maybe
Northern_Tyrrhenian_Sea	M2	Marine area number 2 according to SIBM: Coasts of Sardegna (and Corsica), with North Tyrrhenian Sea from Piombino to Gaeta	yes, no, maybe

Variable (column)	Code	Description	Value
Southern_Tyrrhenian_Sea	M3	Marine area number 3 according to SIBM: Coasts of Campania, Tyrrhenian coasts of Basilicata, Calabria and Sicilia	yes, no, maybe
Messina_Strait	M4	Marine area number 4 according to SIBM: Messina Strait between Sicilia and Calabria	yes, no, maybe
Eastern_Mediterranean_Basin	M5	Marine area number 5 according to SIBM: South-Eastern coasts of Sicilia, Pelagie Islands, Maltese archipelago	yes, no, maybe
Ionian_Sea	M6	Marine area number 6 according to SIBM: Eastern coast of Sicilia (without Messina Strait), Ionian coasts of Calabria and Basilicata and Southern part of Puglia up to Otranto	yes, no, maybe
Southern_Adriatic_Sea	M7	Marine area number 7 according to SIBM: Southern Adriatic Sea, Coasts of Puglia between Otranto and Manfredonia	yes, no, maybe
Middle_Adriatic_Sea	M8	Marine area number 8 according to SIBM: Central Adriatic Sea, coasts between Manfredonia (Puglia) and Conero (Marche)	yes, no, maybe
Northern_Adriatic_Sea	M9	Marine area number 9 according to SIBM: Northern Adriatic Sea, coasts from Conero (Marche) to Istria (Friuli – Venezia Giulia)	yes, no, maybe
taxonRemarks		Nomenclatorial changes from the previous checklist of Braioni & Ricci (1995)	string
occurrenceRemarks		Literature reference for the records in a geographical unit not reported in Braioni & Ricci (1995)	string



ID	Richness	ID	Richness	ID	Richness
R1	198	R12	50	M1	5
R2	0	R13	0	M2	58
R3	185	R14	0	M3	5
R4	67	R15	5	M4	3
R5	40	R16	11	M5	1
R6	17	R17	0	M6	10
R7	7	R18	5	M7	8
R8	188	R19	31	M8	11
R9	34	R20	86	M9	45
R10	97	R21	0		
R11	0	R22	0		

Figure 2. Geographical units of Italy used for the checklist, with colours proportional to the number of species of Rotifera for each unit.

Data set information

In this section we provide information on the data set with metadata record already published on the LifeWatch Italy Data Portal (https://dataportal.lifewatchitaly.eu/view/urn%3Auuid%3Ac1f2ab37-61e4-48e9-b3a9-15bdbf002f9d), with additional specific information related to the Rotifera part.

Object name: Checklist of the Italian Fauna: Rotifera

Characters encoding: Unicode (UTF-8)

Data set citation: Fontaneto D., Bertani I., Cancellario T., Rossetti G., Obertegger U., 2021. Rotifera. In: Bologna M.A., Zapparoli M., Oliverio M., Minelli A., Bonato L., Cianferoni F., Stoch F. (eds.), Checklist of the Italian fauna. Version 1.0. Last update: 2021-05-31.

Format name: Extensible Markup Language (XML) for the Metadata record and CSV for the data set.

Format version: 1.0

Distribution: https://dataportal.lifewatchitaly.eu/view/urn%3Auuid%3Ac1f2ab37-61e4-48e9-b3a9-15bdbf002f9d

Date of creation: May 31st, 2021

Date of last revision: May 31st, 2021

Date of publication: July 23rd, 2021

Update policy: New records will be included periodically, as soon as they become available.

Language: English

License of use: Creative Commons Attribution 4.0 International License

Metadata language: English

Metadata managers: Marco 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: Rotifera

Database manager: Fontaneto D., Bertani I., Cancellario T., Rossetti G., Obertegger U.; Marco 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 Rotifera; 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, together with 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 22 Italian regions, in addition to San Marino Republic and Vatican City. According to the geographical subdivision used by the previous checklists, including that on rotifers of Braioni & Ricci (1995), continental Italy was 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). The geographical units for marine and coastal waters refer to the nine biogeographical sectors identified by the Società Italiana di Biologia Marina, SIBM (Relini 2008, 2010).

Bounding box: All areas falling under Italian administration (in addition to San Marino 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 rotifers, but we used only published data.

Habitat type: Any type of habitat where rotifers can be found was considered (Fontaneto & De Smet 2015). These include all terrestrial and aquatic habitats. The aquatic habitats refer to any freshwater, brackish and marine environment. The terrestrial habitats refer mostly to limno-terrestrial environments such as lichens, mosses, soil, and sediments.

Biogeographic region: Within the Palearctic realm, 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 for terrestrial records and at the level of marine regions for marine records.

Literature records

General description: Only published records are included in the data set. A search through the literature was performed on 15th June 2020.

Literature search methods: We searched through Web of Science, Scopus, and Google Scholar for keywords ('rotifer' or 'Rotifera') and ('Italy' or 'Italian').

Literature list: The 21 papers published after the previous checklist by Braioni & Ricci (1995) and that provided rotifer records for new areas, not previously reported in Braioni & Ricci (1995), are: Bertani et al. (2009), Bertani et al. (2011), Boggero et al. (2016), De Smet et al. (2015), Ferrari et al. (2006), Fontaneto & Ambrosini (2010), Fontaneto & Melone (2003a, 2003b, 2003c) Fontaneto & Ricci (2006), Fontaneto et al. (2004a, 2004b, 2004c), Fontaneto et al. (2006, 2007), Obertegger et al. (2006a, 2006b), Ricci & Melone (1998), Rossetti et al. (2003), Tavernini et al. (2005, 2009). The four papers published before Braioni & Ricci (1995) and that were overlooked are: Ferrari et al. (1986, 1989), Stella & Margaritora (1972), Taticchi (1968).

Quality control for literature data: Additional references were searched through the grey literature with online searches outside the three academic databases and no new records were found. In addition, we scanned the cited references of each paper and we did not find additional overlooked records. We do not claim that the checklist is absolutely complete, but that it is the best we could do. The dynamic nature of the online data set at LifeWatch Italy will allow including potentially overlooked records.

Taxonomic information

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

Taxonomic coverage: phylum Rotifera, intended in its traditional inclusion of Bdelloidea, Monogononta, and Seisonacea, and the exclusion of Acanthocephala (Fontaneto & De Smet 2015).

Taxonomic rank: Only species and subspecies are reported; the data set reports higher taxonomic ranks for each species, including Phylum, Class, Order, Family, Genus.

Taxon specialists: Isabella Bertani, Diego Fontaneto, Ulrike Obertegger, Giampaolo Rossetti.

Nomenclature: The adopted nomenclature followed the species names in the List of Available Names (LAN) for Rotifera (Segers et al. 2012, 2015, Jersabek et al. 2018) for all species described before year 2000, and the name of the original descriptions, potentially amended by subsequent revisions, for all species described after year 2000. The Rotifer LAN is also the basis for nomenclature in the World Register of

Marine Species, WoRMS (Horton et al. 2021). 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 (Braioni & Ricci 1995) is mentioned, according to the nomenclature of the Rotifer LAN. Species that were included in the previous checklist and are now considered not valid by the Rotifer LAN are excluded from the data set.

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 List of Available Names for Rotifera (Segers et al. 2012, 2015, Jersabek et al. 2018) for all species described before year 2000, and with the original descriptions for all species described after year 2000.

ACKNOWLEDGEMENTS

We thank the 'Comitato Scientifico per la Fauna d'Italia' and LifeWatch Italy, who pursued the updates for the checklists of the Italian Fauna. We thank Giulio Melone and Michael Plewka for providing the photos of Fig. 1.

REFERENCES

Bertani, I., Segers, H., & Rossetti, G. (2009). Monogonont rotifers (Rotifera: Monogononta) from Northern Apennine lakes: new and rare taxa for Italy. Acta Biologica - Studi Trentini di Scienze Naturali, 86, 71-74.

Bertani, I., Segers, H., & Rossetti, G. (2011). Biodiversity down by the flow: new records of monogonont rotifers for Italy found in the Po River. Journal of Limnology, 70, 321-328. DOI: 10.4081/jlimnol.2011.321

Boggero, A., Pierri, C., Alber, R., Austoni, M., Barbone, E., Bartolozzi, L., Bertani, I., Campanaro, A., Cattaneo, A., Cianferoni, F., Colangelo, P., Corriero, G., Dorr, A.M., Elia, A.C., Ficetola, G.F., Fontaneto, D., Gaino, E., Goretti, E., Kamburska, L., La Porta, G., Lauceri, R., Lorenzoni, M., Ludovisi, A., Manca, M., Morabito, G., Nonnis Marzano, F., Oggioni, A., Riccardi, N., Rossetti, G., Tagliolato, P., Thaler, B., Ungaro, N., Volta, P., Zaupa, S., Rosati, I., Fiore, N., Basset, A., & Marchetto, A. (2016). A geographic distribution data set of biodiversity in Italian freshwaters. Biogeographia – The Journal of Integrative Biogeography, 31, 55-72. DOI: 10.21426/B631132737

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 – The Journal of Integrative Biogeography, 37, ucl001. DOI: 10.21426/B637156271

Braioni, M.G. & Ricci, C. (1995) - Rotifera. In: A. Minelli, S. Ruffo & S. La Posta (eds), Check list delle specie della fauna italiana, vol. 8. Calderini, Bologna, pp. 1-11.

De Smet, W.H., Melone, G., Fontaneto, D. & Leasi, F., 2015. Marine Rotifera. Fauna d'Italia vol. L. Calderini Bologna, pp. 252. ISBN: 978-88-506-5490-1

de Jong, Y. (2016). Fauna Europaea. Fauna Europaea Consortium. Checklist dataset https://doi.org/10.15468/ymk1bx accessed via GBIF.org on 2021-05-23.

Dumont, H.J. (1983). Biogeography of rotifers. Hydrobiologia, 104, 19-30. DOI: 10.1007/BF00045948

European Environmental Agency (2017). Biogeographical regions in Europe. European Topic Centre on Biological Diversity (ETC/BD). Permalink: 3431629fe50049a7b995d125aad9c71d

Ferrari, I., Farabegoli, A., & Mazzoni, R. (1989). Abundance and diversity of planktonic rotifers in the Po River. Hydrobiologia, 166/167, 201-208. DOI: 10.1007/BF00048913

Ferrari, I., Mazzoni, R., & Solazzi, A. (1986). Il popolamento zooplanctonico del fiume Po nell'estate 1985. Atti VII Congresso A.I.O.L. (Trieste, 11-14 Giugno 1986), 261-266.

Ferrari, I., Viglioli, S., Viaroli, P., & Rossetti, G. (2006). The impact of the summer 2003 drought event on the zooplankton of the Po River (Italy).

Verhandlungen der Internationalen Vereinigung für Theoretische und Angewandte Limnologie, 29, 2143-2149. DOI: 10.1080/03680770.2006.11903071

Fontaneto, D., & Ambrosini, R. (2010). Spatial niche partitioning in epibiont rotifers on the waterlouse *Asellus aquaticus*. Limnology and Oceanography, 55, 1327-1337. DOI: 10.4319/lo.2010.55.3.1327

Fontaneto, D., & De Smet, W.H. (2014). Rotifera, Chapter 4. In: Schmidt-Rhaesa A. (ed.), Handbook of Zoology, Gastrotricha, Cycloneuralia and Gnathifera. Volume 3, Gastrotricha and Gnathifera. De Gruyter GmbH, Berlin, pp. 217-300.

Fontaneto, D., & Melone, G. (2003a). Bdelloid rotifers from lakes above 1700 m in Western Italian Alps, with taxonomic notes on *Dissotrocha macrostyla*. International Review of Hydrobiology, 88, 594-601. DOI: 10.1002/iroh.200310639

Fontaneto, D., & Melone, G. (2003b). On some rotifers new for the Italian fauna. Italian Journal of Zoology, 70, 253-259. DOI: 10.1080/11250000309356526

Fontaneto, D., & Melone, G. (2003c). Redescription of *Pleuretra hystrix*, an endemic alpine bdelloid rotifer. Hydrobiologia, 497, 153-160. DOI: 10.1023/A:1025426024373

Fontaneto, D., & Plewka, M. (2021). Phylum Rotifera. Chapter 17. In: Schierwater, B., & DeSalle, R. (eds.) Invertebrate zoology, a tree of life approach. CRC Press, pp. 263-275. ISBN: 9780367685676

Fontaneto, D., & Ricci, C. (2006). Spatial gradients in species diversity of microscopic animals: the case of bdelloid rotifers at high altitude. Journal of Biogeography, 33, 1305-1313. DOI: 10.1111/j.1365-2699.2006.01502.x

Fontaneto, D., Ficetola, G.F., Ambrosini, R., & Ricci, C. (2006). Patterns of diversity in microscopic animals: are they comparable to those in protists or in larger animals? Global Ecology and Biogeography, 15, 153-162. DOI: 10.1111/j.1466-822X.2006.00193.x

Fontaneto, D., Herniou, E.A., Barraclough, T.G., & Ricci, C. (2007). On the global distribution of microscopic animals: new worldwide data on bdelloid rotifers. Zoological Studies, 46, 336-346.

Fontaneto, D., Melone, G., & Cardini, A. (2004a). Shape diversity in the trophi of different species of *Rotaria* (Rotifera, Bdelloidea): a geometric morphometric study. Italian Journal of Zoology, 71, 63-72. DOI: 10.1080/11250000409356552

Fontaneto, D., Melone, G., & Ricci, C. (2004b). Structure of bdelloid rotifer metacommunities in two alpine streams. Acta Biologica - Studi Trentini di Scienze Naturali, 80, 23-26.

Fontaneto, D., Segers, H., & Melone, G. (2004c). Epizoic rotifers (Rotifera: Monogononta, Bdelloidea) from the gill chambers of *Potamon fluviatile* (Herbst, 1785). Journal of Natural History, 38, 1225-1232. DOI: 10.1080/00222930310001551 97

Horton, T., Kroh, A., Ahyong, et al. (2021). World Register of Marine Species. Available from https://www.marinespecies.org at VLIZ. Accessed 2021-05-23. doi:10.14284/170

International Commission on Zoological Nomenclature (1999). International Code of Zoological Nomenclature, fourth edition. The International Trust for Zoological Nomenclature, London. Available at: https://www.iczn.org/the-code/the-international-code-of-zoological-nomenclature/the-code-online/

Jersabek, C.D., De Smet, W.H., Hinz, C., Fontaneto, D., Hussey, C.G., Michaloudi, E., Wallace, R.L., & Segers, H. (2018). List of Available Names in Zoology, Candidate Part Phylum Rotifera, species-group names established before 1 January 2000. Available at: https://archive.org/details/LANCandidatePartSpeciesRotifera.

Minelli, A., Ruffo, S., & La Posta, S. (eds) (1993-1995). Checklist delle specie della Fauna d'Italia. Ministero dell'Ambiente, Comitato Scientifico per la Fauna d'Italia. Calderini Editore.

Obertegger, U., Braioni, M. G., & Flaim, G. (2006a). The zooplankton of Lake Tovel. Acta Biologica - Studi Trentini di Scienze Naturali, 81, 369-378.

Obertegger, U., Braioni, M., Arrighetti, G., & Flaim, G. (2006b). Trophi morphology and its usefulness for identification of formalin-preserved species of *Synchaeta* Ehrenberg, 1832 (Rotifera: Monogononta: Synchaetidae). Zoologischer Anzeiger, 245, 109-120. DOI: 10.1016/j.jcz.2006.05.005

Relini, G. (ed.) (2008). Checklist della Flora e della Fauna dei mari italiani (I parte). Biologia Marina Mediterranea, 15 (Suppl. 1): 1-457.

Relini, G. (ed.) (2010). Checklist della Flora e della Fauna dei mari italiani (II parte). Biologia Marina Mediterranea, 17 (Suppl. 1): 1-517.

Ricci, C., & Melone, G. (1998) The Philodinavidae (Rotifera Bdelloidea): a special family. Hydrobiologia, 385, 77–85. DOI: 10.1023/A:1003458611180

Rossetti, G., Tireni, F., Viglioli, S., & Ferrari, I. (2003). Ricerche ecologiche in un ambiente acquatico della golena del Po nei pressi di Casalmaggiore. Acta Biologica - Studi Trentini di Scienze Naturali, 80, 193-200.

Secretariat of the Convention on Biological Diversity (2002). Decision VI/23: Alien species that threaten ecosystems, habitats and species. Document UNEP/CBD/COP/6/23. Convention on Biological Diversity Secretariat, Montreal, Canada. Available at: https://www.cbd.int/decision/cop/?id=7197

Segers, H. (2002). The nomenclature of the Rotifera: annotated checklist of valid family- and genus-group names. Journal of Natural History, 36, 631-640. DOI: 10.1080/00222930231733970 7

Segers, H., De Smet, W.H., Fischer, C., Fontaneto, D., Michaloudi, E., Wallace, R. L., & Jersabek, C.D. (2012). Towards a List of Available Names in zoology, partim Phylum Rotifera. Zootaxa, 3179, 61-68. DOI: 10.11646/zootaxa.3179.1.3

Segers, H., De Smet, W.H., Fontaneto, D., Hinz, C., Hussey, C., Michaloudi, E., Wallace, R.L., & Jersabek, C.D. (2015). Period of public commentary begins on the revised proposal of species-group level names, and on the proposal of genus-group level names of the Candidate Part of List of Available Names (LAN) in the phylum Rotifera. European Journal of Taxonomy, 165, 1-3. DOI: 10.5852/ejt.2015.165

Stella, E., & Margaritora, F. (1972). Planktonic biocenosis of Giulianello Lake (Latium, Italy) during the last four years. Verhandlungen des Internationalen Verein Limnologie, 18, 482-488. DOI: 10.1080/03680770.1971.11896021

Taticchi, M.I. (1968). Vicende stagionali delle comunità litoranee del Lago Trasimeno (1963-. 1965). Rivista di Idrobiologia, 7, 195-302.

Tavernini, S., Mura, G., & Rossetti, G. (2005). Factors influencing the seasonal phenology and composition of zooplankton communities in mountain temporary pools. International Review of Hydrobiology, 90, 358-375. DOI: 10.1002/iroh.200510801

Tavernini, S., Viaroli, P., & Rossetti, G. (2009). Zooplankton community structure and inter-annual dynamics in two sand-pit lakes with different dredging impact. International Review of Hydrobiology, 94, 290-307. DOI: 10.1002/iroh.200811124

Submitted: 21 March 2022

First decision: 13 April 2022

Accepted: 1 May 2022

the Guest editors for the special section "The new Checklist of the Italian Fauna":

Marco A. Bologna, Lucio Bonato, Fabio Cianferoni, Alessandro Minelli, Marco Oliverio, Fabio Stoch, Marzio Zapparoli