

## An updated list of chironomid species from Italy with biogeographic considerations (Diptera, Chironomidae)

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### SUMMARY

In a first list of chironomid species from Italy from 1988, 359 species were recognized. The subfamilies represented were Tanypodinae, Diamesinae, Prodiamesinae, Orthocladiinae and Chironominae. Most of the species were cited as widely distributed in the Palearctic region with few Mediterranean (6), Afrotropical (19) or Panpaleotropical (3) species. The list also included five species previously considered Nearctic. An updated list was thereafter prepared and the number of species raised to 391. Species new to science were added in the following years further raising the number of known species. The list of species known to occur in Italy is now updated to 580, and supported by voucher specimens. Most species have a Palearctic distribution, but many species are distributed in other biogeographical regions; 366 species are in common with the East Palearctic region, 281 with the Near East, 248 with North Africa, 213 with the Nearctic, 104 with the Oriental, 23 species with the Neotropical, 23 with the Afrotropical, 16 with the Australian region, and 46 species at present are known to occur only in Italy. On the basis of new findings in Italy and in nearby areas it is stated that the knowledge of chironomid fauna is still incomplete.

## INTRODUCTION

Research on Chironomidae in Italy began in 1900 (Bezzi 1918), but with the exception of a few contributions (Marcuzzi 1949) the study of chironomids in Italy had a substantial progress only after the publication of the identification keys for their aquatic stages, larvae and pupae (Ferrarese and Rossaro 1981, Rossaro 1982a, Ferrarese 1983, Nocentini 1985). Information on species presence and distribution was very scanty before 1968, grew slowly up to 1976 and, in the following 30 years, the number of species known from Italy increased steeply. The list of species belonging to the subfamily of Orthoclaadiinae was reviewed by Rossaro (1979, 1992a) and of other subfamilies by Ferrarese (1982). Thereafter an updated list of species (Boormann et al. 1995, Ferrarese and Rossaro 2001) had been made available on the website of the Checklist of the Italian Fauna (URL 1), but unfortunately, since its publication, the information present in this website has not been updated. Meanwhile revisions of some genera including also the adult stage were carried out (Rossaro 1992b, Rossaro and Lencioni 2000, 2015, Rossaro et al. 2003, Rossaro 2017, Rossaro et al. 2017). In addition, the distribution of chironomids in running waters (Rossaro et al. 2006) and in glacial areas (Rossaro et al. 2016) gave other contributions to the knowledge of Italian fauna. Chironomid research covers systematic, biogeographic and ecological problems. Italy is in the centre of the Mediterranean area, representing a natural bridge between Central Europe and Africa. In Italy, several very different water types and biotopes can be investigated: cold springs, glacier and alpine streams, large lakes (Garda, Maggiore, Como), large rivers (Po, Adige, Ticino, Adda, etc.), Mediterranean streams, brackish waters (Boggero et al. 2017), and coastal lakes. A very long list of species is to be expected and this is indeed the case, although at present the continuous progress suggests that chironomid knowledge is still very incomplete in Italy, as is in other regions including the relatively well studied West Palaearctic area.

The sampling effort pursued during recent decades was well below the need to have a uniform coverage across the country; entire regions such as Calabria and Basilicata are still almost unstudied (Fig. 1), while others were sampled only in very restricted periods (Sardinia, Sicily). Only Lombardia, Valle d'Aosta, Trentino Alto Adige and Abruzzo were sampled with a reasonable frequency.

Water pollution of domestic and industrial origin, the capture of springs and the creation of reservoirs for water supply are unfavourable factors for the preservation of an autochthonous, highly diversified fauna and there is a serious risk that some species will disappear before being discovered. On the other hand, many eurytopic and euryoecious species may be favoured. The large spread of insecticides and water drainage to fight malaria in the Mediterranean countries after the Second World War significantly reduced the species living in marshes. Global warming with the risk of total disappearance of glacial areas is also a very serious matter of concern.

Chironomids are a very ancient group going back to the Triassic or even earlier (Cranston et al. 2012) so the possibility of dispersion in terms of available time was significant, but the stringent ecological needs of stenoecious species suggest a rather restricted distribution with possible endemism and risk of species extinctions. For this reason, chironomids provide an excellent system to study biogeographic questions.

The aim of the present paper is to give an updated list of the species present in Italy.

## MATERIALS AND METHODS

The list of species is based on determinations of adult males when available, but some species are known only on the basis of pupal exuviae; in fewer cases only the larvae are available. Samples were collected with hand-nets, light traps, surface drift nets, and kick samplers (Rossaro 1982a). Larvae were collected alive in

some sites and reared to adults in the laboratory under controlled conditions. In laboratory-reared material, larvae and pupae are associated with adults; this procedure is highly recommended, but requires a lot of experimental effort.



Figure 1. Location of sampling sites in Italy. Only the sites sampled most intensively are indicated. 1. Cold springs and glacial streams in Veny valley (Valle d'Aosta). 2. River Po near Trino Vercellese and Casale Monferrato (Piemonte). 3. River Ticino near Turbigo and Boffalora (Lombardia). 4. Springs near Milano, called "fontanili" and the River Lambro (Lombardia). 5. Prealpine streams near Bergamo (Brembo and Serio) (Lombardia). 6. Ortles-Adamello mountain group sites; many different biotopes, including springs, streams, small lakes, glacial streams (Lombardia, Trentino). 7. Stream Travignolo near Paneveggio (Trentino). 8. River Tagliamento (Friuli). 9. River Bormida (Piemonte). 10. River Po between Piacenza and Cremona (Emilia Romagna). 11. Mantova lakes, along the River Mincio (Lombardia). 12. River Taro and other streams on the northern side of the northern Apennines (Emilia Romagna). 13. Springs in isle of Elba (Toscana). 14. River Potenza near Macerata (Marche). 15. River Aso near San Benedetto del

Tronto (Marche). 16. Rivers Nera, Velino (Lazio). 17. Springs in Roma (Lazio). 18. River Aterno (Abruzzo). 19. Springs and streams in Parco Nazionale d'Abruzzo (Abruzzo). 20. Lake Occhito reservoir between Molise and Puglia, and the River Fortore (Molise). 21. Rivers Sele, Tanagro (Campania). 22. Salterns near Lecce (Puglia). 23. Cedrino and other small streams in northern Sardegna. 24. Lake Bidighinzu reservoir (Sardegna). 25. Rio Mannu and brackish waters in southern Sardegna. 26. Nebrodi springs (Sicilia). 27. Lake Dirillo reservoir (Sicilia).

The species identified were mounted on slides according to Wirth and Marston (1968) and Rossaro et al. (2017). Most of the slides are deposited in the corresponding author's (Rossaro) personal collection. Some voucher specimens are deposited in the Ferrarese personal collection and at the Museo delle Scienze (Trento), *Sergentia* sp. is deposited in the CNR IRSA (Verbania Pallanza) collection and *H. mediterraneus* is deposited in the Senckenberg Naturmuseum Frankfurt (Germany) (Hirvenoja 1973).

Sampling efforts were made in different Italian regions, but Lombardia has been the most intensively sampled. The sites in which the most intensive sampling was carried out are shown in Figure 1, but sampling was carried out also in many other sites. Each sampling site can include many different stations and covers a large area. In some sampling sites, as in Ortles-Adamello (6), River Po (10), River Taro (12), Parco Nazionale d'Abruzzo (19) (see Figure 1), captures were made throughout the year. Sites sampled only at intervals are not reported in Figure 1.

On the checklist, species names are given as reported in Fauna Europaea (de Jong et al. 2014), following the nomenclature rules proposed by Spies and Sæther (2004). In the cases in which Fauna Europaea names were updated by more recent publications, the new names are given, for example the genus *Paratrichocladius* Santos-Abreu, 1918 is now

considered a subgenus of *Cricotopus* van der Wulp, 1874 (Cranston and Krosh 2015).

Table 1. Checklist of the chironomid species currently known from Italy, divided by Subfamily (with all capital letters) and Tribe (in initial capital letter).

#### TELMATOGETONINAE

*Thalassomya frauenfeldi* Schiner, 1856

#### PODONOMINAE

##### Podonomini

*Parochlus kiefferi* (Garrett, 1925)

##### Boreochlini

*Paraboreochlus minutissimus* (Strobl, 1894)

#### TANYPODINAE

##### Clinotanypodini

*Clinotanypus nervosus* (Meigen, 1818)

##### Tanypodini

*Tanypus (Tanypus) kraatzi* (Kieffer, 1912)

*Tanypus (Tanypus) punctipennis* Meigen, 1818

*Tanypus (Tanypus) vilipennis* (Kieffer, 1918)

##### Procladiini

*Procladius (Holotanypus) choreus* (Meigen, 1804)

*Procladius (Holotanypus) culiciformis* (Linnæus, 1767)

*Procladius (Holotanypus) freemani* Sublette, 1964

*Procladius (Holotanypus) Pe 4 sensu* Langton, 1991

*Procladius (Holotanypus) sagittalis* (Kieffer, 1909)

*Procladius (Holotanypus) denticulatus* Sublette, 1964

*Procladius (Holotanypus) tatrensis* Gowin, 1944

*Procladius (Psilotanypus) sp. A sensu* Kieffer, 1906

##### Macropelopiini

*Apsectrotanypus trifascipennis* (Zetterstedt, 1838)

*Macropelopia adauca* Kieffer, 1916

*Macropelopia fehlmanni* (Kieffer, 1912)

*Macropelopia fittkai* Ferrarese & Ceretti, 1987

*Macropelopia nebulosa* (Meigen, 1804)

*Macropelopia notata* (Meigen, 1818)

*Macropelopia rossaroi* Lencioni & Marziali, 2005

*Psectrotanypus varius* (Fabricius, 1787)

##### Natarsiini

*Natarsia nugax* (Walker, 1856)

*Natarsia punctata* (Fabricius, 1805)

##### Pentaneurini

*Telmatopelopia nemorum* (Goetghebuer, 1921)

*Ablabesmyia (Ablabesmyia) aspera* (Roback, 1959)

*Ablabesmyia (Ablabesmyia) longistyla* Fittkau, 1962

*Ablabesmyia (Ablabesmyia) mallochi* (Walley, 1925)

*Ablabesmyia (Ablabesmyia) monilis* (Linnæus, 1758)

*Ablabesmyia (Ablabesmyia) phatta* (Egger, 1864)

*Hayesomyia tripunctata* (Goetghebuer, 1922)

*Xenopelopia falcigera* (Kieffer, 1912)

*Telopelopia fascigera* (Verneaux, 1970)

*Thienemannimyia carnea* (Fabricius, 1805)

*Thienemannimyia lentiginosa* (Fries, 1823)

*Thienemannimyia geijskesi* (Goetghebuer, 1934)

*Thienemannimyia laeta* (Meigen, 1818)

*Thienemannimyia northumbrica* (Edwards, 1929)

*Thienemannimyia vitellina* (Kieffer In Thienemann & Kieffer, 1916)

*Thienemannimyia woodi* (Edwards, 1929)

*Trissopelopia longimanus* (Stäger, 1839)

*Krenopelopia* sp. A Alpen sensu Fittkau, 1962

*Krenopelopia binotata* (Wiedemann, 1817)

*Guttipelopia guttipennis* (van der Wulp, 1861)

*Monopelopia tenuicalcar* (Kieffer, 1918)

*Paramerina cingulata* (Walker, 1856)

*Paramerina divisa* (Walker, 1856)

*Paramerina* sp. A Griechenland sensu Fittkau, 1962

*Paramerina* sp. B Dolomiten sensu Ferrarese, 1982

*Zavrelimyia barbatipes* (Kieffer, 1911)

*Zavrelimyia berberi* Fittkau, 1962

*Zavrelimyia hirtimanus* (Kieffer, 1918)

*Zavrelimyia melanura* (Meigen, 1804)

*Zavrelimyia nubila* (Meigen, 1818)

*Zavrelimyia punctatissima* (Goetghebuer, 1934)

*Zavrelimyia signatipennis* (Kieffer, 1924)

*Larsia atrocincta* (Goetghebuer, 1942)

*Labrundinia longipalpis* (Goetghebuer, 1921)

*Pentaneurella katterjokki* Fittkau & Murray, 1983

*Nilotanypus dubius* (Meigen, 1804)

*Conchapelopia pallidula* (Meigen, 1818)

*Conchapelopia viator* (Kieffer, 1911)

*Rheopelopia maculipennis* (Zetterstedt, 1838)

*Rheopelopia ornata* (Meigen, 1838)

*Rheopelopia perda* (Roback, 1971)

*Schineriella schineri* (Strobl, 1880)

*Arctopelopia* sp. A sensu Ferrarese, 1995

*Arctopelopia griseipennis* (van der Wulp, 1859)

*Arctopelopia barbitarsis* (Zetterstedt, 1850)

#### BUCHONOMYIINAE

*Buchonomyia thienemanni* Fittkau, 1955

#### DIAMESINAE

##### Protanypodini

*Protanypus* sp. A sensu Kieffer, 1906

##### Boreoheptagyini

*Boreoheptagyia alpicola* Serra-Tosio, 1989

*Boreoheptagyia ortladamellica* Rossaro, 2017

*Boreoheptagyia legeri* (Goetghebuer, 1933)

*Boreoheptagyia monticola* Serra-Tosio, 1964

*Boreoheptagyia rotunda* Serra-Tosio, 1983

##### Diamesini

*Pseudodiamesa branickii* (Nowicki, 1873)

*Pseudodiamesa nivosa* (Goetghebuer, 1928)

*Syndiamesa edwardsi* (Pagast, 1947)

*Syndiamesa nigra* Rossaro, 1980

*Diamesa dampfi* (Kieffer, 1924)

*Diamesa permacra* (Walker, 1856)

*Diamesa aberrata* Lundbeck, 1898

*Diamesa incallida* (Walker, 1856)

*Diamesa bertrami* Edwards, 1935

*Diamesa nowickiana* Kownacki & Kownacka, 1975

*Diamesa martae* Kownacki & Kownacka, 1980

*Diamesa longipes* Goetghebuer, 1941

*Diamesa goetghebueri* Pagast, 1947

*Diamesa lindrothi* Goetghebuer, 1931

*Diamesa latitarsis* (Goetghebuer, 1921)

*Diamesa modesta* Serra-Tosio, 1967

*Diamesa laticauda* Serra-Tosio, 1964

*Diamesa wuelkeri* Serra-Tosio, 1964

*Diamesa insignipes* Kieffer in Kieffer & Thienemann, 1908  
*Diamesa* sp. A sensu Rossaro, 1981  
*Diamesa cinerella* Meigen In Gistel, 1835  
*Diamesa tonsa* (Walker, 1856)  
*Diamesa vaillanti* Serra-Tosio, 1972  
*Diamesa zernyi* Edwards, 1933  
*Diamesa steinboeckii* Goetghebuer, 1933  
*Diamesa starmachi* Kownacki & Kownacka, 1970  
*Pseudokiefferiella parva* (Edwards, 1932)  
*Sympothastia spinifera* Serra-Tosio, 1968  
*Sympothastia zavreli* Pagast, 1947  
*Pothastia gaedii* (Meigen, 1838)  
*Pothastia longimanus* (Kieffer, 1922)

#### PRODIAMESINAE

*Monodiamesa bathyphila* (Kieffer, 1918)  
*Odontomesa fulva* (Kieffer, 1919)  
*Prodiamesa* sp. A sensu Kieffer, 1906  
*Prodiamesa olivacea* (Meigen, 1818)  
*Prodiamesa rufovittata* Goetghebuer, 1932

#### ORTHOCLADIINAE

*Dratnalia potamophylaxi* Fittkau & Lellák In Lellák, 1971  
*Diplocladius cultriger* Kieffer, 1908  
*Brillia longifurca* Kieffer, 1921  
*Brillia bifida* (Kieffer, 1909)  
*Euryhopsis annuliventris* Malloch, 1915  
*Cardiocladius fuscus* Kieffer, 1924  
*Cardiocladius capucinus* (Zetterstedt, 1850)  
*Tvetenia bavarica* (Goetghebuer, 1934)  
*Tvetenia calvescens* (Edwards, 1929)  
*Tvetenia discoloripes* (Goetghebuer In Thienemann, 1936)  
*Tvetenia verralli* (Edwards, 1929)  
*Tokunagaia tonollii* Rossaro, 1983  
*Tokunagaia rectangularis* (Goetghebuer, 1940)  
*Eukiefferiella pseudomontana* Goetghebuer, 1935  
*Eukiefferiella ancyla* Svensson, 1986  
*Eukiefferiella brehmi* Gouin, 1943  
*Eukiefferiella clypeata* (Kieffer, 1923)  
*Eukiefferiella cyanea* Thienemann & Harnisch, 1936  
*Eukiefferiella dittmari* Lehmann, 1972  
*Eukiefferiella graeci* (Edwards, 1929)  
*Eukiefferiella coeruleascens* (Kieffer In Zavrel, 1926)  
*Eukiefferiella ilkleyensis* (Edwards, 1929)  
*Eukiefferiella devonica* (Edwards, 1929)  
*Eukiefferiella minor* (Edwards, 1929)  
*Eukiefferiella fittkaui* Lehmann, 1972  
*Eukiefferiella brevicar* (Kieffer, 1911)  
*Eukiefferiella claripennis* (Lundbeck, 1890)  
*Eukiefferiella fuldensis* Fittkau, 1954  
*Eukiefferiella lobifera* Goetghebuer, 1934  
*Eukiefferiella tirolensis* Goetghebuer, 1938  
*Heterotanytarsus apicalis* (Kieffer, 1921)  
*Psectrocladius (Psectrocladius) brehmi* Kieffer, 1923  
*Psectrocladius (Psectrocladius) sordidellus* (Zetterstedt, 1838)  
*Psectrocladius (Psectrocladius) bisetus* Goetghebuer, 1942  
*Psectrocladius (Psectrocladius) limbatellus* (Holmgren, 1869)  
*Psectrocladius (Psectrocladius) octomaculatus* Wülker, 1956  
*Psectrocladius (Psectrocladius) psilopterus* (Kieffer, 1906)  
*Psectrocladius (Psectrocladius) schlienzi* Wülker, 1956  
*Psectrocladius (Psectrocladius) oligosetus* Wülker, 1953

*Psectrocladius (Psectrocladius) oxyura* Langton, 1985  
*Psectrocladius (Allopsectrocladius) obivious* (Walker, 1856)  
*Psectrocladius (Allopsectrocladius) platypus* (Edwards, 1929)  
*Rheocricotopus* sp. A sensu Thienemann & Harnisch, 1932  
*Rheocricotopus (Psilocricotopus) atripes* (Kieffer, 1913)  
*Rheocricotopus (Psilocricotopus) gallicus* Lehmann, 1969  
*Rheocricotopus (Psilocricotopus) glabricollis* (Meigen, 1830)  
*Rheocricotopus (Psilocricotopus) chalybeatus* (Edwards, 1929)  
*Rheocricotopus (Rheocricotopus) effusus* (Walker, 1856)  
*Rheocricotopus (Rheocricotopus) fuscipes* Kieffer, 1909  
*Paracricotopus niger* (Kieffer, 1913)  
*Nanocladius* sp. A sensu Kieffer, 1913  
*Nanocladius balticus* (Palmén, 1959)  
*Nanocladius dichromus* (Kieffer, 1906)  
*Nanocladius rectinervis* (Kieffer, 1911)  
*Parorthocladius nudipennis* (Kieffer, 1908)  
*Synorthocladius semivirens* (Kieffer, 1909)  
*Orthocladius (Eudactylocladius) fuscimanus* (Kieffer in Kieffer & Thienemann, 1908)  
*Orthocladius (Eudactylocladius) gelidus* Kieffer, 1922  
*Orthocladius (Eudactylocladius) priomixtus* Sæther, 2004  
*Orthocladius (Eudactylocladius) olivaceus* Kieffer, 1911  
*Orthocladius (Euorthocladius) ashei* Sponis, 1990  
*Orthocladius (Euorthocladius) luteipes* Goetghebuer, 1938  
*Orthocladius (Euorthocladius) rivicola* Kieffer, 1921  
*Orthocladius (Euorthocladius) rivulorum* Kieffer, 1909  
*Orthocladius (Euorthocladius) saxosus* (Tokunaga, 1939)  
*Orthocladius (Euorthocladius) thienemanni* Kieffer, 1906  
*Orthocladius (Mesorthocladius) frigidus* (Zetterstedt, 1838)  
*Orthocladius (Mesorthocladius) vaillanti* Cranston, 1991  
*Orthocladius (Orthocladius) excavatus* Brundin, 1956  
*Orthocladius (Orthocladius) glabripennis* (Goetghebuer, 1921)  
*Orthocladius (Orthocladius) marchettii* Rossaro & Prato, 1991  
*Orthocladius (Orthocladius) oblidens* (Walker, 1856)  
*Orthocladius (Orthocladius) pedestris* Kieffer, 1909  
*Orthocladius (Orthocladius) rhyacobius* Kieffer, 1911  
*Orthocladius (Orthocladius) rivinus* Kieffer, 1915  
*Orthocladius (Orthocladius) rubicundus* (Meigen, 1818)  
*Orthocladius (Orthocladius) wetterensis* Brundin, 1956  
*Orthocladius (Symposiocladius) lignicola* Kieffer, 1914  
*Orthocladius (Symposiocladius) ruffoi* Rossaro & Prato, 1991  
*Acricotopus lucens* (Zetterstedt, 1850)  
*Paracladius alpicola* (Zetterstedt, 1850)  
*Paraccladius conversus* (Walker, 1856)  
*Cricotopus (Paratrichocladius) guidalii* (Rossaro, 1990)  
*Cricotopus (Paratrichocladius) micans* (Kieffer, 1918)  
*Cricotopus (Paratrichocladius) nivalis* (Goetghebuer, 1938)  
*Cricotopus (Paratrichocladius) osellai* (Rossaro, 1990)  
*Cricotopus (Paratrichocladius) skirwithensis* (Edwards, 1929)  
*Cricotopus (Paratrichocladius) veronicae* (Rossaro, 1992)  
*Cricotopus (Paratrichocladius) pierfrancescoi* (Rossaro, 1991)  
*Cricotopus (Paratrichocladius) lanzavecchiai* (Rossaro, 1990)  
*Cricotopus (Paratrichocladius) rufiviventris* (Meigen, 1830)  
*Halocladius (Halocladius) varians* (Stäger, 1839)

- Halocladius (Halocladius) millenarius* (Santos Abreu, 1918)
- Halocladius (Halocladius) mediterraneus* Hirvenoja, 1973
- Cricotopus (Cricotopus) gelidus* (Kieffer, 1922)
- Cricotopus (Cricotopus) tibialis* (Meigen, 1804)
- Cricotopus (Cricotopus) algarum* (Kieffer, 1911)
- Cricotopus (Cricotopus) fuscus* (Kieffer, 1924)
- Cricotopus (Cricotopus) gr. fuscus* sp. A sensu van der Wulp, 1874
- Cricotopus (Cricotopus) Pe 8 sensu* Langton, 1991
- Cricotopus (Cricotopus) pirifer* Hirvenoja, 1973
- Cricotopus (Cricotopus) curtus* Hirvenoja, 1973
- Cricotopus (Cricotopus) triachripes* Verrall, 1912
- Cricotopus (Cricotopus) tremulus* (Linnæus, 1756)
- Cricotopus (Cricotopus) gr tremulus* sensu van der Wulp, 1874
- Cricotopus (Cricotopus) tristis* Hirvenoja, 1973
- Cricotopus (Cricotopus) sp. A sensu* van der Wulp, 1874
- Cricotopus (Cricotopus) annulator* Goetghebuer, 1927
- Cricotopus (Cricotopus) trifasciatus* Edwards, 1922
- Cricotopus (Cricotopus) cylindraceus* (Kieffer in Kieffer & Thienemann, 1908)
- Cricotopus (Cricotopus) albiforceps* (Kieffer, 1916)
- Cricotopus (Cricotopus) festivellus* (Kieffer, 1906)
- Cricotopus (Cricotopus) vierriensis* Goetghebuer, 1935
- Cricotopus (Cricotopus) bicinctus* (Meigen, 1818)
- Cricotopus (Cricotopus) trifascia* Edwards, 1929
- Cricotopus (Cricotopus) Pe 1 sensu* Langton, 1991
- Cricotopus (Cricotopus) levantinus* Moubayed & Hirvenoja, 1986
- Cricotopus (Isocladius) sylvestris* (Fabricius, 1794)
- Cricotopus (Isocladius) trifasciatus* (Meigen In Panzer, 1813)
- Cricotopus (Isocladius) reversus* Hirvenoja, 1973
- Cricotopus (Isocladius) intersectus* (Stäger, 1839)
- Cricotopus (Isocladius) laricomalis* Edwards, 1932
- Cricotopus (Isocladius) obnixus* (Walker, 1856)
- Cricotopus (Isocladius) brevipalpis* Kieffer, 1909
- Hydrobaenus dentistylus* Moubayed, 1985
- Hydrobaenus conformis* Holmgren, 1869
- Hydrobaenus distylus* (Kieffer, 1915)
- Zalutschia megastyla* (Shilova, 1971)
- Zalutschia tatriva* (Pagast In Zavrel & Pagast, 1935)
- Metriocnemus eurynotus* (Holmgren, 1883)
- Metriocnemus fuscipes* (Meigen, 1818)
- Metriocnemus ursinus* (Holmgren, 1869)
- Thienemannia* sp. A sensu Kieffer, 1909
- Thienemannia gracilis* Kieffer, 1909
- Chaetocladius aedeagolobatus* Rossaro, 2017
- Chaetocladius dentiforceps* (Edwards, 1929)
- Chaetocladius dissipatus* (Edwards, 1929)
- Chaetocladius gelidus* Brundin, 1956
- Chaetocladius gracilis* Brundin, 1956
- Chaetocladius grandilobus* Brundin, 1956
- Chaetocladius holmgreni* (Jacobson, 1898)
- Chaetocladius laminatus* Brundin, 1947
- Chaetocladius melaleucus* (Meigen, 1830)
- Chaetocladius perennis* (Meigen, 1830)
- Chaetocladius piger* (Goetghebuer, 1913)
- Chaetocladius subalpinus* Rossaro, 2017
- Chaetocladius suecicus* (Kieffer In Thienemann & Kieffer, 1916)
- Chaetocladius ticinoi* Rossaro, 2017
- Chaetocladius valdostanus* Rossaro, 2017
- Paratrissocladius excerptus* Gouin In Gouin & Thienemann, 1942
- Heterotrissocladius grimshawi* (Edwards, 1929)
- Heterotrissocladius maereri* Brundin, 1949
- Heterotrissocladius marcidus* (Walker, 1856)
- Parametriocnemus* sp. A sensu Goetghebuer, 1932
- Parametriocnemus boreoalpinus* Gouin In Gouin & Thienemann, 1942
- Parametriocnemus stylatus* (Kieffer, 1924)
- Psilometriocnemus* sp. A sensu Sæther, 1969
- Psilometriocnemus europeus* Tuiskunen, 1985
- Paraphaenocladius* sp. A sensu Thienemann, 1924
- Paraphaenocladius impensus* (Walker, 1856)
- Paraphaenocladius irritus* (Walker, 1856)
- Parakiefferiella bathophila* (Kieffer, 1912)
- Parakiefferiella dentifera* Wülker, 1957
- Parakiefferiella gracillima* (Kieffer, 1924)
- Parakiefferiella wuelkeri* Moubayed, 1994
- Epoicocladius ephemerae* Kieffer, 1924
- Krenosmittia boreoalpina* (Goetghebuer, 1944)
- Krenosmittia camptophleps* (Edwards, 1929)
- Krenosmittia hispanica* Wülker, 1957
- Acamptocladius reissi* Cranston & Saether, 1981
- Stilocladius montanus* Rossaro, 1979
- Rheosmittia spinicornis* (Brundin, 1956)
- Heleniella doreri* Serra-Tosio, 1967
- Heleniella ornaticollis* (Edwards, 1929)
- Heleniella serratosioi* Ringe, 1976
- Parachaetocladius abnobaesus* Wülker, 1959
- Limnophyes aagardii* Sæther, 1985
- Limnophyes algerinus* Marcuzzi, 1950
- Limnophyes asquamatus* Andersen, 1937
- Limnophyes bidumus* Sæther, 1985
- Limnophyes difficilis* Brundin, 1947
- Limnophyes madeirae* Sæther, 1985
- Limnophyes minimus* (Meigen, 1818)
- Limnophyes natalensis* Kieffer, 1914
- Limnophyes pentaplastus* (Kieffer, 1921)
- Limnophyes spinigus* Sæther, 1985
- Paralimnophyes longiseta* (Thienemann, 1919)
- Pseudorthocladius* sp. A sensu Goetghebuer & Lenz, 1943
- Pseudorthocladius curtistylus* (Goetghebuer, 1921)
- Pseudorthocladius uniserratus* Sæther & Sublette, 1983
- Gymnometriocnemus (Gymnometriocnemus) subnudus* (Edwards, 1929)
- Gymnometriocnemus (Rhaphidocladius) brumalis* (Edwards, 1929)
- Bryophaenocladius femineus* (Edwards, 1929)
- Bryophaenocladius flexidens* (Brundin, 1947)
- Bryophaenocladius ictericus* (Meigen, 1830)
- Bryophaenocladius illimbatus* (Edwards, 1929)
- Bryophaenocladius inconstans* (Brundin, 1947)
- Bryophaenocladius nidorum* (Edwards, 1929)
- Bryophaenocladius scanicus* (Edwards, 1929)
- Bryophaenocladius subvernalis* (Edwards, 1929)
- Bryophaenocladius tuberculatus* (Goetghebuer, 1921)
- Bryophaenocladius vernalis* (Goetghebuer, 1921)
- Bryophaenocladius xanthogyne* (Edwards, 1929)
- Parasmittia carinata* Strenzke, 1950
- Georthocladius luteicornis* (Goetghebuer, 1941)
- Symbiocladius rhithrogenae* Kieffer In Zavrel, 1925
- Smittia* sp. A sensu Holmgren, 1869
- Smittia abruzzae* Rossaro & Lencioni, 2000
- Smittia alpicola* Goetghebuer, 1941

*Smittia alpilonga* Rossaro & Lencioni, 2000  
*Smittia amoena* Caspers, 1988  
*Smittia aterrima* (Meigen, 1818)  
*Smittia edwardsi* (Kieffer, 1818)  
*Smittia foliosa* (Kieffer, 1921)  
*Smittia leucopogon* (Meigen, 1804)  
*Smittia nudipennis* (Goetghebuer, 1913)  
*Smittia pratorum* (Goetghebuer, 1927)  
*Smittia rostrata* Goetghebuer In Schmölzer, 1962  
*Smittia scutellosetosa* Caspers, 1989  
*Smittia vesparum* Goetghebuer, 1921  
*Smittia stercoraria* Rossaro & Lencioni, 2000  
*Thalassosmittia thalassophila* (Bequärt & Goetghebuer, 1913)  
*Clunio marinus* Haliday, 1855  
*Camptocladius stercorarius* (De Geer, 1776)  
*Mesosmittia flexuella* (Edwards, 1929)  
*Prosmittia verae* Krashennikov & Makarchenko, 2008  
*Pseudosmittia angusta* Serra-Tosio, 1964  
*Pseudosmittia danconai* Marcuzzi, 1947  
*Pseudosmittia forcipata* (Goetghebuer, 1921)  
*Pseudosmittia gracilis* (Kieffer In Potthast, 1913)  
*Pseudosmittia holsata* Thienemann & Strenzke, 1940  
*Pseudosmittia mathildae* Albu, 1968  
*Pseudosmittia trilobata* (Edwards, 1929)  
*Allocladius longicrus* (Kieffer, 1921)  
*Hydrosmittia brevicornis* Kieffer, 1909  
*Hydrosmittia oxoniana* (Kieffer, 1922)  
*Hydrosmittia ruttneri* Strenzke & Thienemann, 1942  
*Hydrosmittia spinata* Zhang, Liu, Ferrington & Wang, 2016  
*Thienemanniella clavicornis* (Kieffer, 1911)  
*Thienemanniella flavescens* Sasa, 1984  
*Thienemanniella majuscula* (Edwards, 1924)  
*Thienemanniella vittata* (Edwards, 1924)  
*Thienemanniella* sp. A sensu Edwards, 1924  
*Thienemanniella* sp. B sensu Edwards, 1924  
*Corynoneura arctica* Winnertz, 1852  
*Corynoneura celtica* Edwards, 1924  
*Corynoneura coronata* Edwards, 1924  
*Corynoneura edwardsi* Brundin, 1949  
*Corynoneura gratias* Schlee, 1968  
*Corynoneura fittkai* Schlee, 1968  
*Corynoneura lacustris* Edwards, 1924  
*Corynoneura lobata* Edwards, 1924  
*Corynoneura scutellata* Winnertz, 1846

#### CHIRONOMINAE

##### Tanytarsini (Stempellinina)

*Zavrelia pentatoma* Kieffer In Bause, 1913  
*Zavreliella marmorata* (van der Wulp, 1858)  
*Neozavrelia fuldensis* Fittkau, 1954  
*Stempellinella flavidula* Edwards, 1929  
*Stempellinella edwardsi* Spies & Sæther, 2004  
*Stempellina bausei* (Kieffer, 1911)  
*Constempellina brevicosta* (Edwards, 1937)

##### Tanytarsini (Tanytarsina)

*Tanytarsus bathophilus* Kieffer, 1911  
*Tanytarsus brundini* Lindeberg, 1963  
*Tanytarsus buchoni* Reiss & Fittkau, 1971  
*Tanytarsus chinyensis* Goetghebuer, 1934  
*Tanytarsus cretensis* Reiss, 1987  
*Tanytarsus curticornis* Kieffer, 1911  
*Tanytarsus ejuncidus* (Walker, 1856)  
*Tanytarsus eminulus* (Walker, 1856)

*Tanytarsus excavatus* Edwards, 1929  
*Tanytarsus gibbosiceps* Kieffer, 1922  
*Tanytarsus gracilentus* (Holmgren, 1883)  
*Tanytarsus gregarius* Kieffer, 1909  
*Tanytarsus heusdensis* Goetghebuer, 1923  
*Tanytarsus inaequalis* Goetghebuer, 1921  
*Tanytarsus lestagei* Goetghebuer, 1922  
*Tanytarsus mendax* Kieffer, 1925  
*Tanytarsus miriforceps* (Kieffer, 1921)  
*Tanytarsus nemorosus* Edwards, 1929  
*Tanytarsus nigricollis* Goetghebuer, 1939  
*Tanytarsus palettaris* Verneaux, 1969  
*Tanytarsus pallidicornis* (Walker, 1856)  
*Tanytarsus* Pe 23 sensu Langton, 1991  
*Tanytarsus signatus* (van der Wulp, 1858)  
*Tanytarsus sinuatus* Goetghebuer In Thienemann, 1936  
*Tanytarsus sylvaticus* (van der Wulp, 1858)  
*Tanytarsus usmaensis* Pagast, 1931  
*Tanytarsus volgensis* Miseiko, 1967  
*Virgatanytarsus albisutus* (Santos Abreu, 1918)  
*Virgatanytarsus arduennensis* (Goetghebuer, 1922)  
*Virgatanytarsus triangularis* (Goetghebuer, 1928)  
*Cladotanytarsus atridorsum* Kieffer, 1924  
*Cladotanytarsus mancus* (Walker, 1856)  
*Cladotanytarsus nigrovittatus* (Goetghebuer, 1922)  
*Cladotanytarsus vanderwulpi* (Edwards, 1929)  
*Rheotanytarsus ringei* Fittkau, 1960  
*Rheotanytarsus curtistylus* (Goetghebuer, 1921)  
*Rheotanytarsus nigricauda* Fittkau, 1960  
*Rheotanytarsus pellucidus* (Walker, 1848)  
*Rheotanytarsus pentapoda* (Kieffer, 1909)  
*Rheotanytarsus photophilus* (Goetghebuer, 1921)  
*Rheotanytarsus reissi* Lehmann, 1970  
*Rheotanytarsus rhenanus* Klink, 1983  
*Paratanytarsus* sp. A sensu Thienemann & Bause, 1913  
*Paratanytarsus austriacus* (Kieffer In Albrecht, 1924)  
*Paratanytarsus bituberculatus* (Edwards, 1929)  
*Paratanytarsus corsicanus* Moubayed-Breil, Ashe & Langton, 2012  
*Paratanytarsus dissimilis* (Johannsen, 1905)  
*Paratanytarsus grimmii* (Schneider, 1885)  
*Paratanytarsus hyperboreus* Brundin, 1949  
*Paratanytarsus inopertus* (Walker, 1856)  
*Paratanytarsus laccophilus* (Edwards, 1929)  
*Paratanytarsus laetipes* (Meigen, 1830)  
*Paratanytarsus lauterborni* (Kieffer, 1909)  
*Paratanytarsus mediterraneus* Reiss & Sawedal, 1981  
*Paratanytarsus natvigi* (Goetghebuer, 1933)  
*Paratanytarsus penicillatus* (Goetghebuer, 1928)  
*Paratanytarsus tenellulus* (Goetghebuer, 1921)  
*Paratanytarsus tenuis* (Meigen, 1830)  
*Micropsectra appendica* Stur & Ekrem, 2006  
*Micropsectra apposita* (Walker, 1856)  
*Micropsectra aristata* Pinder, 1976  
*Micropsectra atrofasciata* (Kieffer, 1911)  
*Micropsectra attenuata* Reiss, 1969  
*Micropsectra auvergnensis* Reiss, 1969  
*Micropsectra bavarica* Stur & Ekrem, 2006  
*Micropsectra calcifontis* Stur & Ekrem, 2006  
*Micropsectra clastrieri* Reiss, 1969  
*Micropsectra insignilobus* Kieffer, 1924  
*Micropsectra junci* (Meigen, 1818)  
*Micropsectra lindrothi* Goetghebuer In Goetghebuer & Lindroth, 1931

- Micropsectra longicrista* Stur & Ekrem, 2006  
*Micropsectra notescens* (Walker, 1856)  
*Micropsectra pallidula* (Meigen, 1830)  
*Micropsectra pharetrophora* Fittkau & Reiss, 1998  
*Micropsectra radialis* Goetghebuer, 1939  
*Micropsectra recurvata* Goetghebuer, 1928  
*Micropsectra schrankelae* Stur & Ekrem, 2006  
*Micropsectra seguyi* Casas & Laville, 1990  
*Micropsectra sophiae* Stur & Ekrem, 2006  
*Micropsectra zernyi* Marcuzzi, 1950  
*Micropsectra nana* (Meigen, 1818)  
*Micropsectra fallax* (Reiss, 1969)  
*Micropsectra styriaca* (Reiss, 1969)
- Pseudochironomini  
*Pseudochironomus prasinatus* (Stäger, 1839)
- Chironomini  
 Genus near *Paratendipes* Kieffer, 1911  
*Paratendipes albimanus* (Meigen, 1818)  
*Paratendipes nubilus* (Meigen, 1830)  
*Paratendipes nudisquama* Edwards, 1929  
*Paratendipes plebejus* (Meigen, 1818)  
*Microtendipes britteni* (Edwards, 1929)  
*Microtendipes chloris* (Meigen, 1818)  
*Microtendipes diffinis* (Edwards, 1929)  
*Microtendipes pedellus* (De Geer, 1776)  
*Microtendipes rydalensis* (Edwards, 1929)  
*Nilothauma brayi* (Goetghebuer, 1921)  
*Lauterborniella agrayloides* (Kieffer, 1911)  
*Paralauterborniella nigrohalteralis* (Malloch, 1915)  
*Pagastiella orophila* (Edwards, 1929)  
*Sergentia* sp. A sensu Kieffer, 1922  
*Phaenopsectra flavipes* (Meigen, 1818)  
*Phaenopsectra punctipes* (Wiedemann, 1817)  
*Polypedilum (Uresipedilum) convictum* (Walker, 1856)  
*Polypedilum (Uresipedilum) cultellatum* Goetghebuer, 1931  
*Polypedilum (Pentapedilum) nubens* (Edwards, 1929)  
*Polypedilum (Pentapedilum) sordens* (van der Wulp, 1874)  
*Polypedilum (Pentapedilum) tritum* (Walker, 1856)  
*Polypedilum (Pentapedilum) uncinatum* (Goetghebuer, 1921)  
*Polypedilum (Tripodura) acifer* Townes, 1945  
*Polypedilum (Tripodura) aegyptium* Kieffer, 1925  
*Polypedilum (Tripodura) apfelbecki* (Strobl, 1901)  
*Polypedilum (Tripodura) bicrenatum* Kieffer, 1921  
*Polypedilum (Tripodura) pullum* (Zetterstedt, 1838)  
*Polypedilum (Tripodura) quadriguttatum* Kieffer, 1921  
*Polypedilum (Tripodura) scalaenum* (Schrank, 1803)  
*Polypedilum (Polypedilum) acutum* Kieffer, 1915  
*Polypedilum (Polypedilum) albicorne* (Meigen, 1838)  
*Polypedilum (Polypedilum) laetum* (Meigen, 1818)  
*Polypedilum (Polypedilum) lene* Becker, 1908  
*Polypedilum (Polypedilum) nubeculosum* (Meigen, 1804)  
*Polypedilum (Polypedilum) nubifer* (Skuse, 1889)  
*Polypedilum (Polypedilum) pedestre* (Meigen, 1830)  
*Polypedilum* sp. A sensu Kieffer, 1912  
*Lipiniella araeicola* Shilova, 1961  
*Endochironomus albipennis* (Meigen, 1830)  
*Endochironomus tendens* (Fabricius, 1775)  
*Synendotendipes dispar* (Meigen, 1830)  
*Synendotendipes impar* (Walker, 1856)  
*Stictochironomus maculipennis* (Meigen, 1818)  
*Stictochironomus pictulus* (Meigen, 1830)  
*Stenochironomus (Stenochironomus) gibbus* (Fabricius, 1794)
- Stenochironomus (Stenochironomus) ranzii* Rossaro, 1982  
*Stenochironomus (Stenochironomus) spatuliger* Kieffer, 1922  
*Fleuria lacustris* Kieffer, 1924  
*Dicrotendipes lobiger* (Kieffer, 1921)  
*Dicrotendipes nervosus* (Stäger, 1839)  
*Dicrotendipes notatus* (Meigen, 1818)  
*Dicrotendipes peringueyanus* (Kieffer, 1924)  
*Dicrotendipes pulsus* (Walker, 1856)  
*Dicrotendipes tritonus* (Kieffer In Thienemann & Kieffer, 1916)  
*Glyptotendipes (Caulochironomus) foliicola* Kieffer, 1918  
*Glyptotendipes (Caulochironomus) imbecilis* (Walker, 1856)  
*Glyptotendipes (Heynotendipes) signatus* (Kieffer, 1909)  
*Glyptotendipes (Glyptotendipes) cauliginellus* (Kieffer, 1913)  
*Glyptotendipes (Glyptotendipes) pallens* (Meigen, 1804)  
*Glyptotendipes (Glyptotendipes) paripes* (Edwards, 1929)  
*Benthalia carbonaria* (Meigen, 1804)  
*Chironomus (Lobochironomus) dorsalis* Meigen, 1818  
*Chironomus (Chironomus) tentans* Fabricius, 1805  
*Chironomus (Camptochironomus) sp. A* sensu Malloch, 1915  
*Chironomus (Chironomus) alpestris* Goetghebuer, 1934  
*Chironomus (Chironomus) sp. A* sensu Meigen, 1803  
*Chironomus (Chironomus) annularius* Meigen, 1818  
*Chironomus (Chironomus) acerbiphilus* Tokunaga, 1939  
*Chironomus (Chironomus) anthracinus* Zetterstedt, 1860  
*Chironomus (Chironomus) venustus* Pinder, 1978  
*Chironomus (Chironomus) aprilinus* Meigen, 1818  
*Chironomus (Chironomus) calipterus* Kieffer, 1908  
*Chironomus (Chironomus) luridus* Strenzke, 1959  
*Chironomus (Chironomus) melanotus* Keyl, 1961  
*Chironomus (Chironomus) obtusidens* Goetghebuer, 1921  
*Chironomus (Chironomus) plumosus* (Linnæus, 1758)  
*Chironomus (Chironomus) riparius* Meigen, 1804  
*Chironomus (Chironomus) salinarius* Kieffer in Thienemann, 1915  
*Chironomus (Chironomus) lugubris* Zetterstedt, 1850  
*Chironomus (Chironomus) prasinus* Meigen, 1804  
*Chironomus (Chironomus) pseudothummi* Strenzke, 1959  
*Kiefferulus tendipediformis* (Goetghebuer, 1921)  
*Kloosia pusilla* (Linnæus, 1767)  
*Baeotendipes noctivagus* (Kieffer, 1911)  
*Einfeldia pagana* (Meigen, 1838)  
*Xenochironomus xenolabis* (Kieffer, 1916)  
*Cyphomella cornea* Sæther, 1977  
*Cladopelma bicarinatum* (Brundin, 1947)  
*Cladopelma edwardsi* (Kruseman, 1933)  
*Cladopelma virescens* (Meigen, 1818)  
*Cladopelma viridulum* (Linnæus, 1767)  
*Cryptotendipes holsatus* Lenz, 1959  
*Cryptotendipes pseudotener* (Goetghebuer, 1922)  
*Microchironomus tener* (Kieffer, 1818)  
*Parachironomus gracilior* (Kieffer, 1918)  
*Parachironomus biannulatus* (Stäger, 1939)  
*Parachironomus cinctellus* (Goetghebuer, 1921)  
*Parachironomus frequens* (Johannsen, 1905)  
*Parachironomus parilis* (Walker, 1856)  
*Parachironomus monochromus* Lenz, 1921  
*Parachironomus varus* (Goetghebuer, 1921)  
*Parachironomus vitiosus* (Goetghebuer, 1921)  
*Acalcarella* sp. A sensu Shilova, 1955

*Paracladopelma nigrifulum* Goetghebuer, 1942  
*Paracladopelma laminatum* (Kieffer, 1921)  
*Paracladopelma mikianum* (Goetghebuer in Goetghebuer & Lenz, 1937)  
*Paracladopelma camptolabis* (Kieffer, 1913)  
*Beckidia tethys* (Townes, 1945)  
*Beckidia zabolotzkyi* (Goetghebuer, 1938)  
*Harnischia angularis* Albu & Botnariuc, 1966  
*Harnischia curtilamellata* (Malloch, 1915)  
*Harnischia fuscimanus* (Kieffer, 1921)  
*Cryptochironomus albofasciatus* (Stäger, 1839)  
*Cryptochironomus defectus* (Kieffer, 1913)  
*Cryptochironomus obreptans* (Walker, 1856)  
*Cryptochironomus rostratus* Kieffer, 1921  
*Cryptochironomus supplicans* (Meigen, 1830)  
*Saetheria reissi* Jackson, 1977  
*Chernovskia macrocera* Sæther, 1977  
*Robackia demejirei* (Kruseman, 1933)  
*Robackia* sp. A sensu Sæther, 1977  
*Demicryptochironomus vulneratus* (Zetterstedt, 1838)

## RESULTS

A total of 580 species are now known to occur in Italy (Table 1, Table 2) and their distributions in Europe and in areas outside Europe are cited on the Fauna Europaea website (de Jong et al. 2014, URL 5). Other 28 species were previously cited as occurring in Italy (Boormann et al. 1995, Ferrarese and Rossaro 2001), but at present we consider these species as misidentifications.

The discussion about the distribution of species is based on the information present in the Fauna Europaea website (URL 5), but this information has been updated considering contributions published later (Bitušik and Trnková 2019).

Most of the species of the Italian fauna are widespread in the Palearctic region, only some of them have more restricted areas of distribution. As expected the majority of the species are shared with nearby European countries (483 with Germany, 463 with France, 436 with Austria, 411 with the British Isles, 409 with The Netherlands, 368 with Spain, 365 with Sweden, 347 with Ireland, and 345 with Poland).

Outside of Europe, 366 species are shared with the East Palaearctic region, 281 with the near East, 248 with North Africa, 213

with the Nearctic Region, 104 with the Oriental region, 23 with the Neotropical region, 23 with the Afrotropical, and 16 with the Australian region. Interestingly, 46 species are known to occur only in Italy.

It is well accepted that chironomid species distribution can be explained both by ecological and by biogeographical reasons. Cold-stenothermal species are restricted to highlands (most Diamesinae and a part of Orthocladiinae): species belonging to these two subfamilies are widespread in the Alps (Region 4) (Illies 1978, Fittkau and Reiss 1978, Griffith 2006), and many of them are also present in cold countries of Northern Europe. For some species a boreo-alpine vicariance has been proposed: *Diamesa arctica* (Boheman, 1865) is restricted to Scandinavia, while *D. goetghebueri* to the Alps, but new findings such as the presence of *D. lindrothi* in the Alps, contradicted the hypothesis that this species was restricted to the Arctic. Many species found in the Alps are not present in the Apennines, this is likely linked to the lack of glaciers in the latter (Rossaro et al. 2006).

The progress of knowledge in recent decades has been intensive. Three species (*Syndiamesa nigra*, *Tokunagaia tonollii* and *Stilocladius montanus*) were first reported as present only on the southern side of the Italian Alps, but not on the northern one (Rossaro 1988); *S. montanus* was also cited as present in the Apennines (Rossaro 1984). This supported the existence of cold-stenothermal species with an endemic distribution on the southern side of the Alps or with a wider southern distribution. To support this hypothesis it was observed that there were other cold-stenothermal species in the Mediterranean area belonging to the cold-stenothermal genus *Diamesa* (Rossaro and Lencioni 2015, Montagna et al. 2016a) as *D. lavillei* Serra-Tosio, 1970 and *D. thomasi* Serra-Tosio, 1970 cited to be known only from the Pyrenees (Serra-Tosio 1973). To contradict this hypothesis new findings were highlighted; for example, *D. veletensis* Serra-Tosio, 1971 previously considered endemic from the Sierra

Nevada (Spain) was later captured in the Atlas Mountains (Morocco) and in Mongolia, suggesting that the cited species has a much wider distribution including southern and oriental parts of the Palearctic Region (Serra-Tosio 1983). *Diamesa thomasi* was captured in Germany and Poland and *D. lavillei* in the Near East and Caucasus. The area of distribution of *T. tonollii* has been enlarged including England, Scandinavia and the Far East (Makarchenko and Makarchenko 2007) and the area of distribution of *S. montanus* was enlarged to include the northern side of the Alps, Spain, Germany, and Slovakia. The capture of other species of *Stilocladius* (*S. clinopecten* Sæther, 1982) in the southeastern United States, *S. intermedius* and *S. orientalis* Makarchenko et Makarchenko, 2003 (Wang 1998, Makarchenko and Makarchenko 2003) in the Eastern Palaeartic, Eastern European Russia and Finland, further supported the evidence of a much wider distribution of these species. To sum up, even if the existence of endemic species cannot be excluded, the progression of knowledge suggests a large area of distribution for many species.

The lack of substantial differences in species composition of lakes on the northern and southern sides of the Alps convinced us that the Alps are not a zoogeographical barrier for chironomids, as suggested half a century ago (Reiss 1968) and confirmed by more recent contributions (Reiss 1986b, Laville and Serra-Tosio 1996, URL 2, URL 3).

The percentage of Mediterranean, Afro- and Panpaleotropical species in Italy is of interest. The chironomids from the Mediterranean area are estimated to contain 22.7% of Palearctic Mediterranean species and 9% of Ethiopian species (Reiss 1977). Prat (1979, 1980), Moubayed and Laville (1983) and Reiss (1985, 1986a) provided lists of species from single countries within the Mediterranean area but observed low percentages of endemic Mediterranean species. Some species are confirmed to be endemic to the Mediterranean area including North Africa

and the Near East: *Zavreliomyia beriberi*, *Boreoheptagyia cinctipes* (Edwards, 1928), *Cricotopus* (*Cricotopus*) *levantinus*, *Krenosmittia hispanica*, *Paratanytarsus mediterraneus*. In any case, some species are not restricted to the Mediterranean area, but are present in other areas outside Europe. *Cricotopus* (*Paratrachocladus*) *micans* for example is present in six Mediterranean countries, the Near East and North Africa and is present in the Afrotropical region, and *Cricotopus* (*Paratrachocladus*) *lanzavecchiae* is present in Italy, France, Near East and Eastern Palearctic China (Fu et al. 2012).

The halobiont species *Baeotendipes noctivagus* and *Halocladus millenarius* were included in the Mediterranean faunal component (Reiss 1977), but the former species is now also known from Bulgaria, Romania and Ukraine, while the latter is also present in the Canary Islands. Another *Halocladus* species is cited from Italy (*H. mediterraneus*), Corsica, Near East, Spain, Madeira Isle, so this species seems restricted to the Mediterranean area and Madeira. Other species captured in Italy and previously considered endemic Mediterranean species (Reiss 1977), but now known to have a more extended area, are: *Virgatanytarsus albisutus*, present also in Madeira, Canary Islands and Portugal, *Polypedilum acifer* Townes, 1945 which results widespread in Europe and present also in the Nearctic, while *Harnischia angularis* is widespread in Europe and present also in the Eastern Palaeartic and Oriental regions.

About Afro- and Panpaleotropical species, two species previously known with a Panpaleotropical distribution (Reiss 1985, 1986a) now extend their presence to the Mediterranean region and are restricted to southern areas in Italy. They are *Chironomus calipterus*, found in Sardegna, and *Dicrotendipes peringueyanus*, in Sicily. *Polypedilum aegyptium* was supposed to have an Afrotropical distribution, but was collected in northern Italy (Rossaro 1988); after a revision of the species it was discovered that it

had been captured also in Sweden and in other 14 European countries. *Pseudosmittia subtrilobata* was supposed to be an Afrotropical species, but was captured in Sardegna (Boormann et al. 1995); a re-examination of the material deposited in the corresponding author's collection suggests *P. subtrilobata* is a junior synonym of *P. trilobata* even if they are both still considered valid species (Ferrington and Sæther 2011). Another formerly supposed Afrotropical species is *Tanytarsus formosanus* Kieffer, 1911 (= *T. horni* Goetghebuer, 1934), reported from Sicilia by Reiss (1977) and recently captured in other 7 European countries, as in Oriental and Australian regions; yet, no voucher specimens are available in the corresponding author's collection so its presence in Italy should be confirmed.

The following species are reported only from Italy in Fauna Europaea, but they are present outside Europe in other regions: *Cricotopus (Paratrichocladus) pierfrancescoi* presently known from the Eastern Palaearctic; *Euryhapsis annuliventris* present in the Nearctic, *Hydrobaenus dentistylus* present in the Near East, *Limnophyes algerinus* present in North Africa, *Stenochironomus spatuliger* known to occur in different Afrotropical countries (Freeman 1957), and that was captured in Italy in River Mincio (Mantova lakes).

About *Polypedilum (Tripodura) pruina* Freeman, 1954, it is of interest to emphasize that it was considered a valid species and not a junior synonym of *P. (T.) aegyptium* (Chattopadhyay 2000); if accepted as a valid species, *P. (T.) pruina* should be an Oriental species but could be present also in Italy. Another species with an interesting distribution is *Polypedilum nubifer*, apparently originating in the Australian region, but now present almost worldwide, except in the Afrotropical and Neotropical regions. It is an invasive species, recently found in the Nearctic (Wallace et al. 2009); its absence from the Afrotropical region should be confirmed because of its similarity with some Afrotropical species (Cranston et al.

2016); in Italy, it was collected in rice fields (Nocentini 1985, Ferrarese 1992, Rossaro and Cortesi 2013). It is interesting to note that a few species, such as *Rheopelopia perda* and *Saetheria reissi*, formerly reported as Nearctic, were later found in Europe including Italy, *Euryhapsis annuliventris* is still reported only in the Nearctic and in Italy.

The following species were described as new to science (Rossaro 1982b, Rossaro and Lencioni 2000, Rossaro et al. 2017, Rossaro 2017) and at present are reported only from Italy: *Boreheptagyia ortladamellica*, *Chaetocladus aedeagolobatus*, *Chaetocladus subalpinus*, *Chaetocladus ticinoi*, *Chaetocladus valdostanus*, *Smittia abruzzae*, *Stenochironomus ranzii*. Other species new to science captured the first time in Italy are now known from a few other countries: *Orthocladus marchettii* from Germany, *S. alpilonga* from Finland, *Syndiamesa nigra* from Corsica, and *P. corsicanus* initially described from Corsica is now known from Italy (in Molgora, a stream near Milano).

Some notes on some species given in Table 1 and whose presence in Italy was unexpected are here added.

*Procladius (Holotanypus) freemani*: this species was known in North America (Roback 1971) but more recently it was collected in the Russian Far East (URL 4), its presence in Italy (Fucino) is supported by an adult male with associated exuvia and suggests a major range expansion of this species.

*Procladius (Holotanypus) denticulatus*: this species is currently known only from the Nearctic (Roback 1971) and in Italy (Milano Botanical garden) where only pupal exuviae were collected; its presence should be considered as a tentative identification.

*Ablabesmyia (Ablabesmyia) aspera*: formerly known only from the Nearctic (Roback 1971). The capture of an adult male in Italy in a disused clay quarry (Oasi Le Foppe, Lombardia) extends its range in the world.

*Ablabesmyia (Ablabesmyia) mallochi*: known from the Nearctic (Roback 1971) and from the East European Russia (URL 5), now captured in Italy (Lake Dirillo reservoir, Sicilia).

*Chaetocladius holmgreni*: it appears to be a northern species present in Sweden and in Svalbard, its presence in Italy is supported by an adult male captured in the River Aso in Central Apennines.

*Cricotopus gelidus*: a northern species, a male was captured in Italy near a glacial stream (Estellette glacier), but it is also known from Romania and Austria.

*Heterotrissocladius maereri*: a northern species, only pupal exuviae from Italy (Bors glacial stream, Monte Rosa); its identification should be confirmed.

*Limnophyes aagardii*: northern species, but extended to the Russian Far East, and collected as adult males in Sardegna near a spring (Rio Mannu, Sardegna).

*Orthocladius (Eudactylocladius) priomixtus*: apparently widespread but not generally confirmed in Europe, it was identified on the basis of an adult male collected in the River Acqualba in Northern Italy.

*Psilometriocnemus europaeus*: a northern species captured near a glacial stream in Adamello mountain group (Vedretta Lobbia).

*Pseudorthocladius uniserratus*: this species is described as Nearctic (Saether and Sublette 1983), only exuviae found in Italy (Lake Variola, Piemonte), but the species can be easily recognized on the basis of exuviae alone.

*Boreoheptagya ortladamellica*: present in the Alps in Ortles Adamello mountain group. Its presence in other sites must be confirmed.

*Chironomus (Chironomus) lugubris*: with a northern European distribution, but known also from Switzerland and Hungary, in Italy captured in Oasi Le Foppe (Lombardia).

*Beckidia tethys*: described from Nearctic (Saether 1977), but present in Italy (River Po) and in the Balkans; another species of the same genus, *B. zabolotzskyi* was just known from Palaeartic including the Russian Far East.

## CONCLUSIONS

Chironomids have represented important contributions in the development of biogeographic theories. They were a critical group in supporting transantarctic relationships (Brundin 1966), but unfortunately the lack of knowledge and uncertain information from large areas suggests caution in drawing conclusions about the significance of their distributions. As emphasized above, new findings often extended the distribution of some species greatly (Rossaro 1995). The examples given above for *S. montanus* and *D. veletensis* are instructive. In contrast, the discovery of new species with very restricted distribution suggests that the family may contain both widespread and very restricted distribution species. More extensive knowledge of chironomid species distributions is very desirable, at present there are many unexplored regions (see Figure 1 for Italy) and sampling was often concentrated in restricted areas. The resolution of many taxonomic questions will profit from molecular analysis (Montagna et al. 2016b), but new collections accompanied by traditional morphological analysis remain essential.

In conclusion, it can be stated that present knowledge is far from complete. Some regions in the Western Palaeartic are very well studied and revision of checklists is rather recent; 598 species were reported from France in 1990 (Serra-Tosio and Laville 1991), raised to 646 in a 1996 updated list (Laville and Serra-Tosio 1996); a species list from Corsica updated in 2012 included 368 species (Moubayed and Ashe 2012); a checklist of species in Germany updated in 2014 listed 987 species (Orendt et al. 2014); 780 species were reported from Finland updated in 2014

(Paasivirta 2014). Some countries in the Western Palaearctic are not well studied, even if recently some efforts were made; for example, the fauna of Albania included 35-40 species before a recent update (Bitušik and Trnková 2019) raising it to 85-90 species. Recent research (Plóciennik and Pešic 2012; Plóciennik et al. 2014, 2016) updated to 30 the

list of species present in Montenegro, 77 in Croatia and 36 in Bosnia-Herzegovina. The Italian fauna checklist rose from 391 (in 2002) to 580 (in 2019) with the present contribution, but despite efforts species number is still low in comparison to nearby countries (Germany, France).

Table 2. A list of the voucher Chironomid specimens deposited in different collections (one voucher specimen per species is provided here). Column names are as follows: Codespec: abbreviated species name. Stage: stage of the voucher specimen present in the collection as L = Larva, Pe = pupal exuvia, M = adult male. Collection: abbreviated name of the collections as R = corresponding author personal collection, F = Ferrarese personal collection, T = MUSE (Trento Museum) collection, SNF = Senckenberg Naturmuseum Frankfurt collection, CNR IRSA = Verbania, Water Research Institute collection. Sampling date: sampling date of the voucher specimen. Locality: sampling station (river, lake, spring, etc.). Codesample: more detailed sampling site name. UTM-long and UTM-lat: longitude and latitude expressed as Universal Transverse Mercator zone 32.

Codespec	Stage	Collection	Sampling date	Locality	Codesample	UTM-long	UTM-lat
T_frauenfeldi	L	F	1989.VIII.25	Udine	Lignano	819947	5067853
P_kiefferi	M	T	2016.VIII.5	Amola	Amola	633080	5118514
P_minutissimus	M	T	2003.VI.16	Bolzano	Bad Süß	688581	5160272
C_nervosus	L	R	1978.XI.8	PoCremona	CRTNconcanavig	571269	4993342
T_T_kraatzii	L	F	1978.VII.15	PoPiacenza	DCO22A	570493	4992088
T_T_punctipennis	MPe	R	1978.IX.21	PoCremona	CRTN	571218	4993370
T_T_vilipennis	L	R	1967.XI.10	PoVercelli	TrinoC2	444645	5002554
P_H_choreus	M	R	1980.V.26	PoCremona	CRTNconcanavig	571269	4993342
P_H_culiciformis	L	R	1994.IV.1	Orta	Orta	452689	5075484
P_H_freemani	MPe	R	1989.V.5	Fucino	FucinoCa	874712	4674619
P_H_Pe_4	MPe	R	1991.XII.30	Aterno	Aterno	857967	4699723
P_H_sagittalis	M	R	1995.XII.4	MaggioreVares e	Magg30Angera	467223	5068528
P_H_denticulatus	Pe	R	2002.III.20	Milano	OrtoBotanico	518361	5035791
P_H_tatrensis	Pe	R	1987.VI.15	Lys	Vargna	415559	5053976
Procladius_Psilotanypus_ spA	L	R	1982.I.6	PoPiacenza	DCO62I	567578	4993863
A_trifascipennis	PeL	R	1980.VI.30	Olona	QuintoRomano	505212	5034890
M_adaucta	MPe	R	2016.II.16	Milano	MilanoAllevDeFE NS	518171	5035890
M_fehlmanni	Pe	R	1982.I.10	ComoComo	Como01Piona	526211	5108134
M_fittkauii	Pe	F	1984.VI.08	Passo Gavia	S.Apollonia	615706	5128697
M_nebulosa	MPe	R	1986.VI.4	Milano	MilanoVCelloria26	518230	5035914
M_notata	Pe	R	1989.IX.30	Aterno	Aterno	857967	4699723
M_rossaroi	M	T	2003.X.16	Amola	Amola	633080	5118514
P_varius	MPe	R	1980.V.15	AddaBergamo	CorennoPlinio	524170	5104020
N_nugax	L	R	1990.V.4	Ofanto	Ofanto1L	1014965	4546227
N_punctata	L	F	1978.VII.15	Avisio	Misurina	789569	5162298
T_nemorum	L	F	1981.IV.5	PoPiacenza	DCO22A	570493	4992088
A_A_aspera	M	R	2010.IX.8	AddaMilano	OasiLeFoppe01	539786	5051680
A_A_longistyla	M	R	1986.IV.14	MantovaSup	MantovaBesutti	641545	4999432
A_A_mallochi	MPe	R	1984.IX.27	Dirillo	Dirillo125	1005111	4123980
A_A_monilis	M	R	1995.VII.14	ComoComo	Como35Onno	523700	5083321
A_A_phatta	L	F	1978.VII.15	PoPiacenza	DCO22A	570493	4992088
H_tripunctata	L	R	2003.VI.26	TicinoMilano	TicCast5	482342	5037704
X_falcigera	PeM	R	1983.III.21	Milano	Milanonordparco	515866	5039811

T_fascigera	Pe	R	1986.VIII.6	PotenzaMacera ta	Groane Potenza13	878102	4818597
T_carnea	MPe	R	2002.IV.23	Taro	Taro2Cv	552575	4926848
T_lentiginosa	M	R	2016.I.10	Milano	MilanoAllevDeFE NS	518171	5035890
T_geijskesi	M	R	1988.VIII.6	Avisio	Paneveggio	712885	5129515
T_laeta	L	R	2002.III.28	AddaLO	Comazzo1	539192	5018345
T_northumbrica	Pe	R	1986.VIII.6	PotenzaMacera ta	Potenza13	878102	4818597
T_vitellina	Pe	R	2002.VII.1	Taro	Taro5	594500	4962000
T_woodi	Pe	R	1982.IV.18	Gleno	BremboBr	546629	5072097
T_longimanus	M	R	1990.IV.1	Aterno	Veraspring01	867141	4700417
Krenop_Alpen	Pe	R	1988.VIII.5	Avisio	Travignolo1	701635	5131948
K_binotata	MPe	R	1984.IX.-	Arno	Barber	701008	4856489
G_guttipennis	Pe	R	2004.VI.2	Segrino	Segrino51	520640	5075253
M_tenuicalcar	PeM	R	1986.VIII.30	Milano	MilanoV Celoria20	518119	5035967
P_cingulata	M	R	1996.X.23	Olona	Campo_dei_Fiori _Valmolina	487090	5092306
P_divisa	M	R	1996.VI.1	ComoComo	Como35Onno	523700	5083321
Paramerina_Griechenlan d	Pe	R	1984.VI.14	Agogna	Cameri	473957	5038645
Paramerina_spB_Dolomi ten_sensu_Ferrarese	Pe	R	2004.IV.14	Avisio	MalgaCiapela	723591	5145516
Z_barbatipes	Pe	R	1979.IX.14	Olona	SettMilanese	504121	5035671
Z_berberi	MPe	R	1990.VIII.8	Aterno	Veraspring01	867141	4700417
Z_hirtimanus	MPe	R	1992.III.22	Aterno	Vetoio	859058	4699334
Z_melanura	M	R	1989.XI.30	Aterno	Aterno	857967	4699723
Z_nubila	PeF	R	1987.VII.17	Toce	Variolasup	438928	5114153
Z_punctatissima	Pe	R	1990.IX.5	Zittola	ZittF5	923764	4632066
Z_signatipennis	MPe	R	1979.XII.30	Arno	ElbaMCalamita	609211	4728448
L_atrocincta	L	R	1986.III.27	Cedrino	Siniscola	559243	4492818
L_longipalpis	L	F	1995.VI.24	Catania	Grammichele	998897	4135006
P_katterjokki	L	F	2009.I.15	Como	Como staz 20	505897	5074082
N_dubius	L	R	1988.VIII.5	Avisio	Paneveggio	712885	5129515
C_pallidula	M	R	1977.VIII.12	Olona	SettMilanese	504121	5035671
C_viator	M	R	1990.VI.24	Aterno	Veraspring01	867141	4700417
R_maculipennis	M	R	1986.IV.21	MantovaSup	MantovaPtaPrete	641545	4999432
R_ornata	M	R	1979.VII.6	PoCremona	CRTNconcanavig	571269	4993342
R_perda	Pe	R	1986.IV.1	Cedrino	Siniscola	559243	4492818
S_schineri	Pe	R	1994.VI.18	Avisio	Fiavé	642644	5096224
Arctopeloplia_spA	L	R	1991.IV.9	AdigeBZ	Braies	736563	5175805
A_griseipennis	M	R	1992.IV.12	Aterno	Vetoio	859058	4699334
A_barbitarsis	L	F	1978.VII.15	PoPiacenza	DCO22A	570493	4992088
B_thienemanni	Pe	R	2002.VII.3	Taro	Taro2Cm	552307	4926989
Protanypus_spA	L	R	2011.VII.-	Palu	Palu	549870	5122190
B_alpicola_spC	M	R	1996.IX.7	Estellette	CdSeigne3bis	332169	5070368
B_ortladamellica	Pe	R	1977.II.28	Gallavesa	Gallavesa	537551	5073888
B_legeri	L	R	1988.VIII.5	Avisio	Paneveggio	712885	5129515
B_monticola	Pe	R	1978.VI.9	AltoOglio	Temu	612869	5122614
B_rotunda	M	R	1988.VIII.5	Avisio	Paneveggio	712885	5129515
P_branickii	MPe	R	1979.IX.8	Adamello	Aviolo00b	609268	5116531
P_nivosa	MPe	R	1984.IX.-	MteBianco_Mi age_Combal	Combalou	334391	5071364
Snd_edwardsi	M	R	1997.VIII.16	Disgrazia	Bignami	573147	5130940
S_nigra	Pe	R	1980.VII.20	AltoOglio	SApollsorgsopra	615524	5128571
D_dampfi	M	R	1995.IX.16	Lys	Gressoney_St_Jac ques	408029	5078131
D_permacra	MPe	R	1976.II.28	Acqualba	Acqualba02	449489	5075773
D_aberrata	MPe	R	2003.IX.17	Sforzellina	Gaviasforz1	615524	5128571
D_incallida	MPe	R	1979.VII.9	Adamello	Aviolo01	609179	5116498
D_bertrami	M	R	2001.IX.18	Forni	Fornig	620489	5141848
D_nowickiana	MPe	R	1990.IX.13	Presena	Presenaalphatorrg lac	623419	5122224

D_martae	M	T	2014.VIII.11	Amola	AmolaAM1	631738	5119284
D_longipes	M	R	1978.VIII.12	Venerocolo	Bnd04a	613290	5115268
D_goetghebueri	M	R	1978.VIII.12	Venerocolo	Bnd04k	613363	5115201
D_lindrothi	PeM	R	1995.IX.10	Estellette	RifElisabetta	331800	5070368
D_latitarsis	MPe	R	2013.IX.25	Forni	Fornig	620489	5141848
D_modesta	M	R	2001.IX.18	Sforzellina	GaviaBerni2	615865	5134173
D_laticauda	M	R	1995.IX.11	Estellette	RifElisabetta	331800	5070368
D_wuelkeri	MPe	R	1978.VIII.12	Venerocolo	Bnd04k	613363	5115201
D_insignipes	MPe	R	1980.II.29	Nure	Nure	539660	4942433
Diamesa_spA	L	R	1978.IV.14	Presanella	Volpaia	628814	5127109
D_cinerella	MPe	R	2001.IX.18	Sforzellina	GaviaBerni2	615865	5134173
D_tonsa	MPeL	R	1979.VII.-	AltoOglio	Vezaa2	608369	5121281
D_vaillantii	M	R	2001.IX.18	Sforzellina	GaviaBerni2	615865	5134173
D_zernyi	M	R	2001.IX.18	Sforzellina	GaviaBerni2	615865	5134173
D_steinboeckii	L	R	1978.IX.25	Adamello	Venerocolo	614420	5114984
D_starmachi	L	R	2007.XII.28	Presanella	Volpaia	628814	5127109
P_parva	MPe	R	2013.VIII.21	Forni	Fornig	620489	5141848
S_spiniifera	MPeL	R	1981.I.15	TicinoMilano	TicinoBoff	484665	5032855
S_zavreli	L	R	1986.I.2	Cedrina	Siniscola	559243	4492818
P_gaedii	MPe	R	1995.II.16	TicinoNO	TicOleggio	475151	5051750
P_longimanus	MPe	R	1981.I.15	TicinoMilano	TicinoBoff	484665	5032855
M_bathyphila	L	R	2008.VI.10	Vernago	Vernago	640130	5178654
O_fulva	L	R	1996.X.28	Lambro	Lamb09La	519380	5067701
Prodiamesa_spA	Pe	R	1978.VIII.19	Tonale	Capriolilake	622053	5123141
P_olivacea	MPe	R	1989.VI.5	Aterno	Aterno	857967	4699723
P_rufovittata	Pe	R	1981.VI.6	PoPiacenza	DCO22A	570493	4992088
D_potamophylaxi	L	F	1993.VII.11	val Pusteria	Fundres	706216	5196124
D_cultriger	M	R	1985.IX.26	MteBianco_Mi	Combalou	334391	5071364
B_longifurca	MPe	R	1977.VIII.31	Gallavesa	Gallavesa	537551	5073888
B_bifida	M	R	1996.II.9	ComoComo	Como10Bellagio	519878	5092394
E_annuliventris	M	R	1985.V.11	TicinoMilano	TicinoBoff	484665	5032855
C_fuscus	L	R	1986.III.13	AddaCremona	AddaRivolta1	538763	5035679
C_capucinus	M	R	1979.VIII.14	Mandrone	RifBedoleValGen	623091	5117326
T_bavarica	MPe	R	2001.IX.18	Sforzellina	Dosegu42	616401	5136569
T_calvescens	M	R	1996.IX.7	Estellette	CdSeigne2bis	331864	5069996
T_discoloripes	Pe	R	1990.IV.17	Velino	Velino	806448	4715053
T_verralli	Pe	R	2004.XII.1	GardaBrescia	Garda01Rivalit	643371	5082468
T_tonollii	M	R	1983.VI.26	AddaSondrio	ChiareggGhPorul	559393	5128900
T_rectangularis	M	R	2003.IX.17	Sforzellina	Gaviasforz1	615524	5128571
E_pseudomontana	Pe	R	1979.III.27	Bidente	Bidente	733199	4894612
E_ancyla	Pe	R	2002.IX.17	Taro	Taro1	547215	4925108
E_brehmi	L	R	1992.V.26	Zittola	ZittF1	923104	4629904
E_clypeata	Pe	R	2001.XII.4	AddaCremona	AddaRivolta	538756	5035592
E_cyanea	Pe	R	2003.III.4	Taro	Taro3CN	573000	4936509
E_dittmari	MPe	R	1980.XI.4	Endine	Gaiano01	574936	5071413
E_gracei	M	R	1985.IX.16	AddaSondrio	RifViolaAEM	602451	5148696
E_coerulescens	M	R	1977.IX.8	Gallavesa	Gallavesa	537551	5073888
E_ilkleyensis	M	R	1978.IV.30	rioMannu	RioMannu	502876	4344594
E_devonica	L	R	1977.VIII.14	Stelvio	StelvBraul	611943	5153951
E_minor	Pe	R	1978.I.26	Lambro	Lamb03La	520441	5080463
E_fittkaii	M	R	1978.III.25	AltoOglio	Vezaa2	608369	5121281
E_brevicalcar	M	R	1985.IX.16	AddaSondrio	Adda00	594262	5155818
E_claripennis	M	R	1990.V.29	Brasimone	Brasimone	669194	4887903
E_fuldensis	MPe	R	1990.IX.17	Mandrone	RifBedoleValGen	623091	5117326
E_lobifera	Pe	R	1978.VII.12	PoVercelli	TrinoA3	444525	5002362
E_tirolensis	Pe	R	1978.III.4	AltoOglio	Vezaa2	608369	5121281
H_apicalis	M	R	1995.VII.7	Miage	Miagetorbiera	334131	5071516
P_P_brehmi	M	R	1984.IX.14	Ofanto	Torremag	1022953	4635666
P_P_sordidellus	M	R	1995.XI.20	MaggioreVares	Magg30Angera	467223	5068528

P_P_bisetus	Pe	F	1993.V.26	Avisio	Inghiaie	678930	5096706
P_P_limbataellus	MPe	R	2002.I.15	Milano	OrtoBotanico	518361	5035791
P_P_octomaculatus	M	R	1986.III.18	MantovaSup	MantovaBelfiore	641545	4999432
P_P_psiolopterus	M	R	1985.VII.17	AddaSondrio	ValViola	604062	5150057
P_P_schlienzi	Pe	R	1987.VII.2	Lys	Vargna	415559	5053976
P_P_oligosetus	Pe	R	1991.V.9	Avisio	LSPellegrino	717418	5141549
P_P_oxyura	M	R	1996.I.29	MaggioreVares	Magg30Angera	467223	5068528
P_A_obvious	Pe	R	1998.IX.10	Miage	Miagetorbiera	334131	5071516
P_A_platypus	Pe	R	1990.IV.26	TevereRoma	CPT16	782137	4626569
Rheocricotopus_spA	L	R	2016.XII.27	AddaLC	Curone	530323	5060630
R_P_atripes	MPe	R	1978.V.21	Sangro	PNA13	910241	4641205
R_P_gallicus	M	R	1990.IX.13	Mandrone	Nardiscascata	635067	5114350
R_P_glabricollis	M	R	1978.IV.30	rioMannu	RioMannu	502876	4344594
R_P_chalybeatus	M	R	1978.IX.21	PoCremona	CRTNconcanavig	571269	4993342
R_R_effusus	MPe	R	1976.III.10	Lambro	Lamb01Ma	520220	5085069
R_R_fuscipes	M	R	1977.XII.27	Lambro	Lamb06Ca0	517622	5075710
P_niger	M	R	1977.VII.30	Coghinas	Gologoni	545815	4462198
Nanocladius_spA	M	R	1990.III.5	Zittola	Zitt50	920327	4635381
N_balticus	Pe	R	2004.X.24	ComoComo	Como50Lecco	529557	5077862
N_dichromus	MPe	R	1977.XI.1	Pordenone	Sile	781805	5079380
N_rectinervis	Pe	R	1989.V.1	Aterno	Aterno	857967	4699723
P_nudipennis	M	R	1978.VIII.24	AltoOglio	Veza2	608369	5121281
S_semivirens	M	R	1985.IX.8	TicinoMllano	TicinoBoff	484665	5032855
O_E_fuscimanus	M	R	1980.VII.14	AltoOglio	VezzafontanaA	607782	5121704
O_E_gelidus	M	R	1978.VI.10	AltoOglio	SAPollsorg1	615524	5128571
O_E_priomixtus	M	R	1976.VI.14	Acqualba	Acqualba02	449489	5075773
O_E_olivaceus	MPe	R	1976.VI.14	Acqualba	Acqualba02	449489	5075773
O_E_ashei	Pe	R	1980.IX.1	Brembo	Brembo01Cs	547369	5090515
O_E_luteipes	MPe	R	1976.II.3	Pioverna	Pioverna	529525	5094752
O_E_rivicola	MPeL	R	2001.II.23	TicinoMllano	TicCast9	481332	5038114
O_E_rivulorum	M	R	1979.II.25	TicinoMllano	TicTurbigo	478207	5039474
O_E_saxosus	MPeL	R	1976.II.32	Acqualba	Acqualba02	449489	5075773
O_E_thienemanni	MPeL	R	2001.II.1	TicinoMilano	TicCast5	482342	5037704
O_M_frigidus	MPe	R	1996.VII.7	Caldaro	Coredo	679320	5143088
O_M_vallanti	MPe	R	2002.VI.4	Taro	Taro1	547215	4925108
O_O_excavatus	MPeL	R	1989.XI.7	Aterno	Veraspring01	867141	4700417
O_O_glabripennis	MPe	R	1981.I.11	TicinoMilano	TicinoBoff	484665	5032855
O_O_marchettii	MPe	R	1992.II.28	Aterno	Aterno	857967	4699723
O_O_oblidens	MPe	R	2004.VIII.30	Lambro	Lamb06Ca0	517622	5075710
O_O_pedestris	MPeL	R	2002.IV.23	Taro	Taro2Cv	552575	4926848
O_O_rhyacobius	MPe	R	1992.II.5	Aterno	Aterno	857967	4699723
O_O_rivinus	MPeL	R	1990.II.26	Aterno	Aterno	857967	4699723
O_O_rubicundus	L	R	2002.I.10	Taro	Taro3CN	573000	4936509
O_O_wetterensis	MPeL	R	1981.III.2	Magra	AbetonePss	635997	4888177
O_S_lignicola	MPe	R	2002.I.10	Taro	Taro2Cm	552307	4926989
O_S_ruffoi	MPe	R	1978.V.20	Scanno	PNA09	905950	4647245
A_lucens	L	R	1979.V.24	PoCremona	CRTNconcanavig	571269	4993342
P_alpicola	L	R	2009.VIII.28	Gran_Paradiso	ROSSET	354517	5039876
P_conversus	M	R	2004.VI.22	Lugano	LuganoPorlezza	498709	5090441
C_P_guidalii	M	R	1978.IV.23	Presanella	Stavel	627964	5126164
C_P_micans	M	R	0.-.	TeverePG	Vera	767687	4799507
C_P_nivalis	M	R	1978.VII.5	AltoOglio	SAPollsorg1	615524	5128571
C_P_osellai	M	R	1978.III.4	AltoOglio	Veza1	607505	5121164
C_P_skirwithensis	MPe	R	1995.VII.7	Miage	Brenvagsorg	341977	5073605
C_P_veronicae	M	R	1989.XII.29	Aterno	Vera	867092	4700658
C_P_pierfrancescoi	M	R	1989.IV.27	Aterno	Aterno	857967	4699723
C_P_lanzavecchiai	M	R	1989.V.3	Aterno	Veraspring01	867141	4700417
C_P_rufiventris	MPe	R	1994.II.6	Aterno	Aterno	857967	4699723
H_varians	M	R	1958.VI.29	Litveneto	LagunaVenezia	757435	5028462
H_millennarius	M	R	1978.IV.29	rioMannu	Molentargius	502876	4344594
H_mediterraneus	M	SNF	1960.VI.12	Quiliano	CavidiLavagna	449005	4902497
C_C_gelidus	MPe	R	1980.VII.6	AltoOglio	VezzafontanaB	607790	5121728
C_C_tibialis	MPeL	R	1980.VII.6	AltoOglio	VezzafontanaB	607790	5121728

C_C_algarum	M	R	1992.V.13	Aterno	Vetoio	859058	4699334
C_C_fuscus	MPe	R	1981.III.21	Aso	Aso01	850907	4757521
Cricotopus_gr_fuscus_sp A	M	R	1988.VIII.3	Tovel	TovelPM	650303	5125065
Cricotopus_Pe_8	Pe	R	1988.XI.11	Sangro	Sangr008S14	918396	4634233
C_C_pirifer	Pe	R	1991.IX.4	AdigeTN	Calaita	715542	5120410
C_C_curtus	MPe	R	1978.IV.23	AltoOglio	VezzafontanaA	607782	5121704
C_C_pulchripes	MPeL	R	1980.VII.6	AltoOglio	VezzafontanaB	607790	5121728
C_C_tremulus	MPe	R	1979.IX.8	AltoOglio	Vezza2	608369	5121281
Cricotopus_gr_tremulus_ spA	L	R	1990.IV.1	Aterno	Veraspring01	867141	4700417
Cricotopus_Cricotopus_s pA	Pe	R	1978.VIII.24	AltoOglio	Vezza2	608369	5121281
C_C_tristis	M	R	1982.VII.7	PoPiacenza	DCO73	570823	4992986
C_C_annulator	MPe	R	1978.VI.27	Lambro	Lamb04As	520907	5078146
C_C_triannulatus	M	R	1996.VII.18	ComoComo	Como35Onno	523700	5083321
C_C_cylindraceus	Pe	F	1991.IV.4	Avisio	Udai	707395	5148429
C_C_albiforceps	M	R	1995.X.21	ComoComo	Como35Onno	523700	5083321
C_C_festivellus	M	R	1978.IV.29	rioMannu	Molentargius	502876	4344594
C_C_vierriensis	MPe	R	2003.IX.24	TicinoMilano	TicCast5	482342	5037704
C_C_bicinctus	MPe	R	2016.XII.27	AddaLC	Molgora	530613	5041608
C_C_trifascia	M	R	1995.XI.9	Lambro	Lamb09La	519380	5067701
Cricotopus_Pe_1	Pe	R	2003.VII.9	TicinoMilano	TicCastCuggiono	482055	5037909
C_C_levantinus	Pe	R	1988.XI.11	Sangro	Sangr008S11	918068	4634542
C_I_sylvestris	M	R	1982.V.5	PoPiacenza	DCO71	568685	4992396
C_I_trifasciatus	M	R	1977.V.2	Lambro	Limito	525086	5036232
C_I_reversus	Pe	R	2004.X.24	Garlate	Garlate	532270	5072531
C_I_intersectus	M	R	1978.V.20	Scanno	PNA08Pescassero li	903686	4652577
C_I_laricomalis	M	R	1980.IX.20	Cervino	Cervinia_eta	393244	5087402
C_I_obnixus	M	R	1981.VI.23	PoPiacenza	DCO71	568685	4992396
C_I_brevipalpis	L	R	1989.VI.7	Aveto	Riondo	523864	4923842
H_dentistylus	M	R	1996.I.29	MaggioreVares e	Magg30Angera	467223	5068528
H_conformis	M	R	1992.IV.22	Scanno	PNA08Pescassero li	903686	4652577
H_distylus	L	R	1978.XI.21	PoCremona	CRTNconcanavig	571269	4993342
Z_megastyla	Pe	R	1978.VIII.4	Presena	Presenaalphatorrg lac	623419	5122224
Z_tatrica	M	R	1985.VI.14	AddaSondrio	ValViola	604062	5150057
M_eurynotus	MPe	R	1980.II.24	AltoOglio	SAPollsorg1	615524	5128571
M_fuscipes	M	R	1978.III.15	Olona	SettMilanese	504121	5035671
M_ursinus	MPe	R	1991.XI.27	Zittola	ZittF5	923764	4632066
Thienemannia_spA	M	R	1989.V.3	Aterno	Vera	867092	4700658
T_gracilis	M	R	1992.I.23	Aterno	Vetoio	859058	4699334
C_aedeagolobatus	M	R	1995.IX.10	Miage	Miagegiardsorg0	335514	5072155
C_dentiforceps	MPe	R	1995.IX.11	LaLexBlanche	LaLeBla4	333014	5070955
C_dissipatus	M	R	2001.IX.18	Sforzellina	Dosegu42	616401	5136569
C_gelidus	MPe	R	1997.IX.14	Estellette	RifElisabetta	331800	5070368
C_gracilis	MPe	R	1977.XII.3	Olona	SettMilanese	504121	5035671
C_grandilobus	M	R	2014.IV.18	AltoOglio	SAPollusc1	617231	5126942
C_holmgreni	M	R	1979.III.28	Aso	Aso02	859874	4764444
C_laminatus	MPe	R	1978.I.20	Lambro	Lamb01Ma	520220	5085069
C_melaleucus	M	R	1979.XI.7	AltoOglio	SAPollsorg1	615524	5128571
C_perennis	MPe	R	1990.IX.13	Mandrone	Nardiscascata	635067	5114350
C_piger	M	R	1997.II.10	Varese	VareseSchiranna	483302	5071733
C_subalpinus	MPe	R	1997.IX.14	Estellette	CdSeigne0bisaffl	330381	5068956
C_suecicus	MPe	R	1978.III.25	AltoOglio	Vezza2	608369	5121281
C_ticinoi	M	R	1994.III.30	TicinoMilano	TicinoBoff	484665	5032855
C_valdostanus	MPe	R	1997.IX.13	Estellette	CdSeigne3bis	332169	5070368
P_excerptus	M	R	1992.V.27	Aterno	Vetoio	859058	4699334
H_grimshavi	MPe	R	1978.V.21	Sangro	PNA13	910241	4641205
H_maereri	Pe	R	1978.VII.27	MteRosa	Bors	415429	5082343
H_marcidus	MPe	R	1981.VIII.1	PoTO	PoPiandelRe	326225	4980941

Parametricnemus_spA	MPe	R	1981.III.5	Magra	AbetonePsso	635997	4888177
P_boreoalpinus	MPe	R	1978.VI.10	AltoOglio	SAppollorg1	615524	5128571
P_stylatus	M	R	1987.IV.15	Reno	PtedellaVenturina	659997	4888717
Psilometricnemus_spA	MPe	R	2013.VIII.21	Forni	Fornig	620489	5141848
P_europaeus	M	R	1990.IX.12	Mandrone	LobbiaVedretta	622751	5117326
Paraphaenocladus_spA	M	R	1978.VII.10	AltoOglio	CividateCamuno	600727	5091262
P_impensus	M	R	1986.IV.21	MantovaSup	MantovaBelfiore	641545	4999432
P_irritus	M	R	1990.IX.12	Mandrone	LobbiaVedretta	622751	5117326
P_bathophila	M	R	1994.IV.7	Orta	Orta	452689	5075484
P_dentifera	Pe	R	2004.IX.28	Tovel	Tovel12m	650248	5125032
P_gracillima	MPeL	R	1981.III.2	Magra	AbetonePsso	635997	4888177
P_spD_Wülker	Pe	R	2003.V.13	Taro	Taro3CN	573000	4936509
E_ephemerae	M	R	1986.V.8	MantovaSup	MantovaBelfiore	641545	4999432
K_boreoalpina	MPe	R	1997.VII.29	AddaSondrio	ChiareggGhPorul a	559393	5128900
K_campthopleps	M	R	1978.V.21	Tasso	PNA11	904671	4643070
K_hispanica	Pe	R	1986.VIII.6	PotenzaMacera ta	Potenza06	859400	4807143
A_reissi	L	F	1991.IX.4	Avisio	Udai	707395	5148429
S_montanus	MPe	R	2014.IV.4	Presanella	Baita_Velon	627124	5125966
R_spinicornis	MPe	R	1975.VI.-	PoPiacenza	DCO22A	570493	4992088
H_dorieri	MPe	R	2014.III.28	Presanella	Baita_Velon	627124	5125966
H_orntaticollis	MPe	R	1978.VI.10	AltoOglio	SAppollusc1	617231	5126942
H_serratosioi	MPe	R	1980.IX.21	Cervino	Cervinia_eta	393244	5087402
P_abnobaeus	L	R	1977.VI.18	Livigno	Foscagno	593140	5149485
L_aagardii	M	R	1978.III.1	rioMannu	STeruAvixi	513088	4376075
L_algerinus	M	R	1990.II.17	Zittola	ZittF5	923764	4632066
L_asquamatus	M	R	1995.VII.7	MteBianco_Mi age_Combal	Combalou	334391	5071364
L_bidumus	M	R	1978.VII.30	AltoOglio	Frigidolfo1	616851	5126469
L_difficilis	M	R	1987.VI.30	Lys	Lys10fronteghiac ciaio	406854	5080029
L_madeirae	M	R	1992.IV.22	Tasso	PNA10	906135	4644303
L_minimus	M	R	1995.X.21	ComoComo	Como35Onno	523700	5083321
L_natalensis	MPe	R	1978.VII.30	AltoOglio	Frigidolfo1	616851	5126469
L_pentaplastus	MPe	R	1981.VI.15	PoVercelli	Morano	451155	5000835
L_spinigus	M	R	1992.X.30	Aterno	Vetoio	859058	4699334
P_longiseta	M	R	1992.VII.14	Aterno	Vetoio	859058	4699334
Pseudorthocladus_spA	M	R	1989.V.3	Aterno	Vera	867092	4700658
P_curtistylus	M	R	1989.V.3	Aterno	Vera	867092	4700658
P_uniserratus	Pe	R	1987.VII.17	Toce	Variolainf	439536	5114165
G_G_subnudus	M	R	1979.III.27	Bidente	Bidente	733199	4894612
G_R_brumalis	M	R	1990.IX.11	Mandrone	RifBedoleValGen ova	623091	5117326
B_femineus	M	R	1985.VII.17	AddaSondrio	ValViola	604062	5150057
B_flexidens	L	R	1986.III.8	PotenzaMacera ta	Potenza09	872396	4813551
B_ictericus	M	R	2004.IV.3	AnnoneEst	Annone	527310	5071603
B_illimbatus	M	R	1992.VII.28	Aterno	Vetoio	859058	4699334
B_inconstans	M	R	2004.IX.22	Forni	Fornia	620394	5141761
B_nidorum	M	R	1985.VI.15	TicinoMilano	TicinoBoff	484665	5032855
B_scanicus	M	R	1978.V.19	Sangro	PNA02fontanaSS 83	898127	4638427
B_subvernalis	M	R	1988.XI.11	Sangro	Sangr009	918567	4633513
B_tuberculatus	M	R	1992.X.30	Aterno	Vetoio	859058	4699334
B_vernalis	M	R	1996.IX.29	ComoComo	Como35Onno	523700	5083321
B_xanthogyne	M	R	1996.IX.24	Carealto	carC5	626285	5106966
P_carinata	M	R	1979.III.27	Bidente	Bidente	733199	4894612
G_luteicornis	Pe	F	1992.VI.18	Verbania	Val Onsernone	460876	5114481
S_rhithrogenae	L	R	1989.V.28	Agogna	Agogna04b	467426	5034972
Smittia_spA	M	R	1994.IV.1	Orta	Orta	452689	5075484
S_abruzzae	M	R	1992.IV.22	Scanno	PNA08Pescassero li	903686	4652577
S_alpicola	M	R	1978.V.3	PoPiacenza	IsSerafiniCattivell	571320	4994216

<i>S_alpilinga</i>	M	R	1997.IX.12	Estellette	RifElisabetta	331800	5070368
<i>S_amoena</i>	M	R	1979.I.29	Aso	Aso01	850907	4757521
<i>S_aterrima</i>	M	R	1997.I.12	FontaniliMilan	ScagoCugaRancal	640777	5088955
<i>Smt_edwardsi</i>	M	R	1986.IX.10	Varese	VareseSchiranna	483302	5071733
<i>S_foliosa</i>	M	R	1986.III.18	MantovaSup	MantovaBelfiore	641545	4999432
<i>S_leucopogon</i>	M	R	1995.IX.20	ComoComo	Como35Onno	523700	5083321
<i>S_nudipennis</i>	M	R	1983.IX.19	Occhito	Occhito212	996096	4620726
<i>S_pratorum</i>	M	R	1996.I.14	MaggioreVares	Magg30Angera	467223	5068528
<i>S_rostrata</i>	M	R	1990.IX.12	Mandrone	LobbiaVedretta	622751	5117326
<i>S_scutellosetosa</i>	M	R	1982.III.25	PoPiacenza	DCO22A	570493	4992088
<i>S_vesparum</i>	M	R	1995.VII.4	Ferret	FerretghPredeBar	349794	5083387
<i>S_stercoraria</i>	M	R	1991.IV.4	Avisio	Udai	707395	5148429
<i>T_thalassophila</i>	M	F	1940.-.-	Venezia	Venezia	760663	5038443
<i>C_marinus</i>	M	F	1938.VI.26	Venezia	Venezia	760663	5038443
<i>C_stercorarius</i>	M	R	2003.IX.17	Sforzellina	Gaviasforz1	615524	5128571
<i>M_flexuella</i>	M	R	1989.IV.24	TeverePG	TevUmb	767687	4799507
<i>P_verae</i>	M	R	2011.II.7	Liscia	Bidighinzu	471957	4489174
<i>P_angusta</i>	M	F	1800.-.-	Venezia	Venezia	760663	5038443
<i>P_danconai</i>	M	R	1986.IV.14	MantovaSup	MantovaBelfiore	641545	4999432
<i>P_forcipata</i>	M	R	1995.VII.4	Ferret	FerretghPredeBar	349794	5083387
<i>P_gracilis</i>	L	R	1967.XI.10	PoVercelli	TrinoC1	444602	5002553
<i>P_holsata</i>	M	R	1980.IV.17	Aso	Aso04	886973	4779213
<i>P_mathildae</i>	M	F	1991.IX.4	Avisio	Udai	707395	5148429
<i>P_trilobata</i>	M	R	1986.III.26	Cedrino	Siniscola	559243	4492818
<i>A_longicrus</i>	M	R	1992.XI.6	Zittola	ZittF1	923104	4629904
<i>H_brevicornis</i>	M	R	1979.VIII.16	AltoOglio	Ercavalloou02	619302	5132349
<i>H_oxoniana</i>	M	R	1990.IX.12	Mandrone	Bedole1	623091	5117326
<i>H_ruttneri</i>	M	R	1992.IV.22	Zittola	ZittF5	923764	4632066
<i>H_spinata</i>	M	R	2011.VII.-	MteBianco	MteBiancorifugio	329131	5077979
<i>T_clavicornis</i>	M	R	1978.V.21	Sangro	PNA13	910241	4641205
<i>T_flavescens</i>	M	R	1977.VII.19	Coghinas	Ortobene	545815	4462198
<i>T_majuscula</i>	M	R	1993.VI.29	Agogna	Agogna89a	467446	5038676
<i>T_vittata</i>	M	R	1977.XII.27	Aso	Lamb05SC	859874	4764444
<i>Thiella_spA</i>	M	R	1980.IV.17	Aso	Aso02	859874	4764444
<i>T_vittata_spB</i>	M	R	1979.III.28	Lambro	Aso02	519023	5076193
<i>C_arctica</i>	M	R	1995.VII.4	Ferret	FerretParcheggio2	342186	5076177
<i>C_celtica</i>	M	R	1982.XII.9	Brembo	Ola01	558208	5077237
<i>C_coronata</i>	M	R	1989.V.5	Pescara	Gizio	909259	4663301
<i>Corynoneura_edwardsi</i>	M	R	1986.V.8	MantovaSup	MantovaBelfiore	641545	4999432
<i>C_gratias</i>	M	R	1985.VI.15	TicinoMilano	Ticino	501959	5035569
<i>C_fittkau</i>	M	R	1989.XI.28	Aterno	Vera	867092	4700658
<i>C_lacustris</i>	M	R	1985.IX.21	Toce	Variolasup	438928	5114153
<i>C_lobata</i>	M	R	1997.I.13	Varese	VareseSchiranna0	483302	5071733
<i>C_scutellata</i>	L	R	1977.X.31	Milano	MilanovCeloria20	518119	5035967
<i>Z_pentatoma</i>	Pe	R	1982.VI.22	Sorno	Sorna	648952	5073709
<i>Z_marmorata</i>	L	R	2011.V.20	AddaMilano	OasiLeFoppe01	539786	5051680
<i>N_fuldensis</i>	M	R	2004.III.19	GardaBrescia	Garda50Peschiera	631591	5034162
<i>S_flavidula</i>	MPe	R	1987.VII.28	Aterno	Veraspring01	867141	4700417
<i>Stemp_edwardsi</i>	M	R	1995.XI.5	ComoComo	Como35Onno	523700	5083321
<i>S_bausei</i>	M	R	2009.III.22	Agogna	Rile	468067	5024198
<i>C_brevicosta</i>	Pe	F	2003.VI.10	Verona	M.Lessini	672678	5061177
<i>T_bathophilus</i>	M	R	1985.VII.17	AddaSondrio	Adda01a	603761	5148787
<i>T_brundini</i>	Pe	R	2004.IV.3	Garlate	Garlate	532270	5072531
<i>T_buchonius</i>	M	R	1983.VI.-	Milano	FontanMIOvest	508292	5032283
<i>T_chinyensis</i>	M	R	1996.VII.18	ComoComo	Como20Como20	505897	5074082
<i>T_cretensis</i>	Pe	R	2004.VI.16	Monate	Monate	473629	5071882
<i>T_curticornis</i>	M	R	2016.II.8	Milano	MilanoAllevDeFE	518171	5035890

T_ejuncidus	Pe	R	2003.VIII.23	GardaBrescia	Garda46SirmGrC atullo	625707	5039722
T_eminulus	M	R	2016.X.29	Lambro	Lamb08Me	518672	5070470
T_excavatus	M	R	1996.IX.10	Varese	VareseSchiranna	483302	5071733
T_gibbosiceps	MPe	R	1979.XII.30	Arno	ElbaMCalamita	609211	4728448
T_gracilentus	Pe	R	2004.III.22	Iseo	IseoSarnico	574536	5056535
T_gregarius	Pe	R	1995.V.1	MaggioreVares e	Magg30Angera	467223	5068528
T_heusdensis	M	R	2018.IV.19	AddaLC	Curone	530323	5060630
T_inaequalis	Pe	R	1995.III.2	MaggioreVares e	Magg30Angera	467223	5068528
T_lestagei	M	R	2004.IV.27	MaggioreVares e	Magg45Castellet toTicino	469336	5063754
T_mendax	M	R	1996.VI.5	Varese	VareseSchiranna	483302	5071733
T_miriforceps	MPe	R	2005.IV.6	Lamar	Lamar	659332	5107182
T_nemorosus	Pe	R	2004.IV.8	Montorfano	Montorfano	510738	5070196
T_nigricollis	M	R	1986.IV.8	MantovaSup	MantovaPtaPrete	641545	4999432
T_palettaris	M	R	1989.VII.31	Brasimone	Brasimone	669194	4887903
T_pallidicornis	M	R	1984.IX.14	Ofanto	Torremag	1022953	4635666
Tanytarsus_Pe23_Langton	Pe	R	1975.V.-	PoCremona	CRTN	571218	4993370
T_signatus	Pe	R	1986.IV.1	Cedriano	Siniscola	559243	4492818
T_sinuatus	M	R	1995.VII.7	MteBianco_Mi age_Combal	Combalou	334391	5071364
T_sylvaticus	M	R	1996.II.13	MaggioreVares e	Magg30Angera	467223	5068528
T_usmaensis	M	R	2009.III.17	Milano	OrtoBotanico	518361	5035791
T_volgensis	MPe	R	1978.IX.21	PoPiacenza	DCO22A	570493	4992088
V_albisutus	MPe	R	2002.VIII.30	Taro	Taro5	594500	4962000
V_arduennensis	MPe	R	2016.V.31	Milano	InverigoLagoon	470860	5083575
V_triangularis	MPe	R	1998.IX.28	Quiliano	QuilianoSolco	449005	4902497
C_atridorsum	M	R	1989.IV.24	TeverePG	TevSovara	767687	4799507
C_mancus	M	R	1986.IX.16	MantovaSup	MantovaBelfiore	641545	4999432
C_nigrovittatus	M	R	1985.V.11	TicinoMilano	TicinoBoff	484665	5032855
C_vanderwulpi	M	R	2017.IV.19	Lambro	Lamb05SC	519023	5076193
R_ringei	M	R	1984.VI.12	Dirillo	Dirillo	1005111	4123980
R_curtistylus	MPe	R	1979.VII.-	Coghinas	Gologoni	545815	4462198
R_nigricauda	M	R	1989.VIII.24	Brasimone	Brasimone	669194	4887903
R_pellucidus	MPe	R	1998.X.24	Quiliano	Daned	451570	4904412
R_pentapoda	MPe	R	1976.V.30	Acqualba	Acqualba02	449489	5075773
R_photophilus	M	R	1989.V.5	Pescara	Gizio	909259	4663301
R_reissi	M	R	1986.III.8	PotenzaMacera ta	Potenza07	862786	4809622
R_rhenanus	M	R	1985.IV.25	TicinoMilano	TicinoBoff	484665	5032855
Paratanytarsus_spA	Pe	R	2004.VI.1	GardaBrescia	Garda21Padenghe	618397	5039143
P_austriacus	M	R	1997.IX.14	MteBianco_Mi age_Combal	Combalou	334391	5071364
P_bituberculatus	M	R	2009.IV.24	Milano	OrtoBotanico	518361	5035791
P_corsicanus	M	R	2012.X.9	AddaLC	Molgora	530613	5041608
P_dissimilis	M	R	1986.IV.8	MantovaSup	MantovaPtaPrete	641545	4999432
P_grimmii	L	R	1976	Trebbia	PiaArda26	571898	4976514
P_hyperboreus	Pe	R	1988.VIII.6	Avisio	Paneveggio	712885	5129515
P_inopertus	M	R	1992.I.23	Aterno	Vetoio	859058	4699334
P_laccophilus	Pe	R	2004.III.19	GardaBrescia	Garda50Peschiera lit	631591	5034162
P_laetipes	M	R	1982.VI.22	GardaBrescia	Garda45Sirmione	625665	5040038
P_lauterborni	M	R	1977.VIII.12	Olona	SettMilanese	504121	5035671
P_mediterraneus	M	R	1986.VI.13	MantovaMezzo	MantovaLMezzo	641437	5003452
P_natvigi	M	R	2009.III.22	Agogna	Rile	468067	5024198
P_penicillatus	Pe	F	1996	Avisio	Udai	707395	5148429
P_tenellulus	M	R	1986.IV.14	MantovaSup	MantovaPtaPrete	641545	4999432
P_tenuis	M	R	1995.X.21	ComoComo	Como35Onno	523700	5083321
M_appendica	Pe	R	1976.VIII.12	Gallavesa	Gallavesa	537551	5073888

M_apposita	MPe	R	1999.II.17	GardaVR	Garda31chir	635788	5060364
M_aristata	M	R	1986.VI.4	Milano	FontanMIOvest	508292	5032283
M_atrofasciata	MPe	R	1999.IV.25	Serio	Ricengo	557491	5049648
M_attenuata	MPe	R	1983.VI.22	AddaSondrio	ChiareggGhPorul a	559393	5128900
M_auvergnensis	Pe	R	1980.III.22	Olona	QuintoRomano	505212	5034890
M_bavarica	Pe	R	2009.IX.3	Tovel	Risla	650204	5124879
M_calcifontis	M	R	1995.VII.4	Ferret	FerretghPredeBar	349794	5083387
M_clastrieri	PeM	R	1983.VI.26	PoCremona	Chiavenna	569511	4991048
M_insignilobus	Pe	R	2014.-.-	Serio	Valzurio	575357	5086075
M_junci	Pe	R	1998.VI.23	Cornisello	Cornisello	630632	5121371
M_lindrothi	M	R	1986.IV.29	MantovaSup	MantovaPtaPrete	641545	4999432
M_longicrista	M	R	1982.I.12	Brembo	Ola01	558208	5077237
M_notescens	MPe	R	1989.X.21	Aterno	Vera	867092	4700658
M_pallidula	MPe	R	1983.I.12	Brembo	Ola01	558208	5077237
M_pharetrophora	MPe	R	1979.IX.8	Adamello	Aviolo01	609179	5116498
M_radialis	M	R	1981.IX.4	ComoComo	Como01Piona3	526585	5107877
M_recurvata	M	R	1981.IV.11	Brembo	SerinaB	556473	5079234
M_schrankelae	M	R	1978.VI.10	AltoOglio	SAPollsorg1	615524	5128571
M_seguyi	MPe	R	2001.IX.10	AltoOglio	Monno	602875	5117231
M_sofiae	M	R	1979.IX.6	Adamello	AviolotorrslA	609202	5116590
M_zernyi	M	R	1978.III.4	Scanno	Vezaa1	905950	4647245
M_nana	M	R	2002.VII.31	Ortles_Careser	PianVenezia	628329	5143498
M_fallax	Pe	R	1978.VI.10	AltoOglio	SAPollsorg1	615524	5128571
M_styriaca	M	R	1995.VI.7	Varese	VareseSchiranna4	483302	5071733
P_prasinatus	Pe	R	1995.VII.1	MaggioreVares e	Magg30Angera	467223	5068528
Paratendipes_Pel	Pe	R	1980.VII.14	PoPiacenza	DCO92N	575998	4997271
P_albimanus	M	R	1994.IV.7	Mergozzo	MergozzoSEC10	458389	5089439
P_nubilus	M	R	1996.VII.18	ComoComo	Como35Onno	523700	5083321
P_nudisquama	MPe	R	2004.II.16	GardaVR	Garda17bSalo15a	620065	5051399
P_plebejus	M	R	2017.III.15	AddaLC	Curone	530323	5060630
M_britteni	MPe	R	2016.II.8	Milano	MilanoAllevDeFE NS	518171	5035890
M_chloris	M	R	1996.IV.18	ComoComo	Como35Onno	523700	5083321
M_diffinis	MPe	R	2002.VII.3	Taro	Taro2Compiano	552416	4926985
M_pedellus	MPe	R	1995.III.12	Varese	VareseSchiranna2	483302	5071733
M_rydalensis	MPe	R	2002.V.15	Taro	Taro2Cm	552307	4926989
N_brayi	Pe	F	1991.IV.9	Bacchiglione	Ferrarese	673948	5088492
L_agrayloides	Pe	R	2004.VI.30	Segrino	Segrino51	520640	5075253
P_nigrohalteralis	L	R	2007.V.25	ComoComo	Como44Valmadre ra10	528729	5078674
P_orphila	L	R	2009.IX.4	MaggioreVares e	Magg35Ranco10b	466348	5071691
Sergentia_spA	L	CNR IRSA	1963.VII.-	Carezza	Carezza	695971	5143602
P_flavipes	M	R	1995.X.21	ComoComo	Como35Onno	523700	5083321
P_punctipes	M	R	1986.IV.21	MantovaSup	MantovaBelfiore	641545	4999432
P_U_convictum	M	R	1996.VIII.29	Olona	RancioValcuvia	490890	5042301
P_U_cultellatum	M	R	1980.V.3	Milano	MilanoPV	511170	5035678
P_P_nubens	M	R	1996.VII.18	ComoComo	Como35Onno	523700	5083321
P_P_sordens	M	R	2009.IV.11	Milano	OrtoBotanico	518361	5035791
P_P_tritum	M	R	2016.I.25	Milano	MilanoAllevDeFE NS	518171	5035890
P_P_uncinatum	M	R	2009.IV.14	Milano	OrtoBotanico	518361	5035791
P_T_acifer	MPe	R	1978.IX.21	PoPiacenza	DCO22A	570493	4992088
P_T_aegyptium	M	R	1982.V.28	PoCremona	CRTNbp7	571166	4993407
P_T_apfelbecki	Pe	R	2004.VI.12	ComoComo	Como09Argegno0 00	509955	5087903
P_T_bicrenatum	M	R	1995.VI.3	MaggioreVares e	MaggAngera10	467178	5068511
P_T_pullum	M	R	1982.VII.6	PoCremona	CRTNbp7	571166	4993407
P_T_quadriguttatum	M	R	1979.IX.12	PoPiacenza	DCO22A	570493	4992088
P_T_scalaenum	M	R	1980.VIII.29	Aterno	Vera	867092	4700658

P_P_acutum	M	R	1978.IV.23	Presanella	Stavel	627964	5126164
P_P_albicorne	MPeL	R	1976.VI.-	Acqualba	Acqualba02	449489	5075773
P_P_laetum	MPe	R	1982.IV.19	Brembo	BremboAlm	546934	5065510
P_P_lene	M	R	2001.VI.18	Milano	OasiLipu	510278	5052140
P_P_nubeculosum	M	R	1995.VII.1	MaggioreVares e	Magg30Angera	467223	5068528
P_P_nubifer	M	R	2017.III.15	AddaLC	Curone	530323	5060630
P_P_pedestre	M	R	1983.VI.6	Olona	SettMilanese	504121	5035671
Polypedilum_Pe_1	Pe	R	1991.IV.9	Bacchiglione	Ferrarese	673948	5088492
L_araenicola	L	R	2006.X.5	Milano	CavaCaMorta	505562	5069712
E_albipennis	Pe	R	1994.IV.27	Varese	VareseSchiranna2	483302	5071733
E_tendens	M	R	1984.VII.9	Endine	Endine	573105	5069667
S_dispar	L	R	1974.VII.26	PoPiacenza	IsSerPc	571564	4994569
S_impar	M	R	1995.VII.7	Miage	Miagetorbiera	334131	5071516
Stc_maculipennis	Pe	R	1982.V.17	PoPiacenza	DCO62I	567578	4993863
S_pictulus	M	R	1995.X.7	ComoComo	Como35Onno	523700	5083321
S_gibbus	M	R	2004.VIII.3	Lugano	LuganoPorlezza	498709	5090441
S_ranzii	M	R	1982.VII.6	PoPiacenza	DCO73	570823	4992986
S_spatuliger	M	R	1986.V.8	MantovaPtaSup	MantovaPtaPrete	641545	4999432
F_lacustris	L	R	2006.V.3	Viverone	ViveroneVT1LII	425028	5028684
D_lobiger	M	R	1988.VIII.3	Tovel	TovelPM	650303	5125065
D_nervosus	L	R	1987.V.12	Varese	VareseSchiranna2	483302	5071733
D_notatus	MPe	R	2009.VIII.14	Milano	AllevamentoBiodi p	518223	5035821
D_peringueyanus	M	R	1983.X.6	Dirillo	Dirillo125	1005111	4123980
D_pulsus	M	R	1996.VI.15	ComoComo	Como35Onno	523700	5083321
D_tritonus	Pe	R	2004.VI.22	Lugano	LuganoPorlezza	498709	5090441
G_C_foliicola	Pe	R	2005.IX.28	AnnoneEst	AnnoneE01	526888	5073664
G_C_imbecilis	Pe	R	2001.IX.10	GardaBrescia	Garda50Peschiera lit	631591	5034162
G_H_signatus	Pe	R	2004.VI.22	Montorfano	Montorfano	510738	5070196
G_G_cauliginellus	MPe	R	1981.I.15	PoPiacenza	IsSerafiniCattivell i	571320	4994216
G_G_pallens	M	R	1995.IX.21	MaggioreVares e	Magg30Angera	467223	5068528
G_G_paripes	L	F	1978.-.-	PoPiacenza	DCO22A	570493	4992088
B_carbonaria	L	R	2005.III.17	AnnoneEst	AnnoneE07	527182	5073692
C_L_dorsalis	MPe	R	2010.IV.27	AddaMIlano	OasiLeFoppe01	539786	5051680
C_C_tentans	M	R	1982.III.26	PoPiacenza	DCO73	570823	4992986
C_Camp_tspA	L	R	1996.IV.25	Varese	VareseSchiranna2	483302	5071733
C_C_alpestris	MPe	R	1997.III.19	Trebbia	Bobbiofitodep	531655	4957200
Chironomus_spA	Pe	R	2004.VI.3	Garlate	Garlate	532270	5072531
C_C_annularius	MPe	R	1997.IV.8	Trebbia	Bobbiofitodep	531655	4957200
C_C_acerbiphilus	chrom	R	1999.III.24	Toce	Toce01	446435	5105763
C_C_anthracinus	M	R	1996.X.31	Monate	Monate370	473415	5071716
C_C_venustus	M	R	2005.IV.3	Caldonazzo	Caldonazzo	673408	5099231
C_C_aprilinus	MPe	R	2016.I.26	Secchia	Poiano	614496	4915686
C_C_calipterus	MPe	R	1979.VII.2	rioMannu	PulaFoce	501348	4317627
C_C_luridus	MPe	R	1997.III.19	Trebbia	Bobbiofitodep	531655	4957200
C_C_melanotus	MPe	R	2000.III.10	PoPiacenza	IsSerafiniCattivell i	571320	4994216
C_C_obtusidens	chrom	R	2006.XII.4	PoPiacenza	IsSerafiniCattivell i	571320	4994216
C_C_plumosus	MPe	R	2006.VII.10	Milano	AllevamentoBiodi p	518223	5035821
C_C_riparius	MPe	R	1982.IV.18	Brembo	BremboClanezzo	561912	5098159
C_C_salinarius	chrom	R	2016.V.25	Lecce	Lecce	1281713	4516495
C_C_lugubris	M	R	2010.IX.9	AddaMIlano	OasiLeFoppe03	539786	5051680
C_C_prasinus	MPe	R	1980.XII.18	PoCremona	CRTNconcanavig	571269	4993342
C_C_pseudothummi	M	R	2011.VII.16	AddaMIlano	OasiLeFoppe01	539786	5051680
K_tendipediformis	M	R	1981.IV.23	PoCremona	CRTNbp1	571166	4993338
K_pusilla	Pe	R	1981.VIII.31	PoPiacenza	DCO22L	570493	4992088
B_noctivagus	M	R	1978.IX.6	rioMannu	Molentargius	502876	4344594
E_pagana	L	F	1978	PoPiacenza	DCO22A	570493	4992088

X_xenolabis	M	R	1986.X.9	MantovaSup	MantovaPtaPrete	641545	4999432
C_cornea	L	F	1981	Bacchiglione	Bacchiglione	730089	5022385
C_bicarinatum	Pe	R	2004.V.11	Segrino	Segrino51	520640	5075253
Cladopelma_edwardsi	Pe	R	2004.IX.30	Pusiano	Pusianolake	521477	5071293
C_virescens	M	R	1996.VII.1	Varese	VareseSchiranna2	483302	5071733
C_viridulum	MPe	R	1996.I.4	MaggioreVares e	Magg30Angera	467223	5068528
C_holsatus	L	R	2005.IV.6	Lamar	Lamar	659332	5107182
C_pseudotener	Pe	R	2003.V.13	Taro	Taro5	594500	4962000
M_tener	M	R	1986.V.8	MantovaSup	MantovaBelfiore	641545	4999432
P_gracilior	Pe	R	2004.IX.20	Monate	Monate822	474965	5070929
P_biannulatus	Pe	R	2004.VI.23	Iseo	IseoSarnico	574536	5056535
P_cinctellus	M	R	1994.IV.27	Varese	VareseSchiranna2	483302	5071733
P_frequens	Pe	R	2004.VI.1	GardaBrescia	Garda12Toscolan o10	626038	5054520
P_parilis	MPe	R	1980.VI.15	AddaMilano	OasiLeBine	539786	5051680
P_monochromus	M	R	1982.VI.23	PoPiacenza	DCO73	570823	4992986
P_varus	MPe	R	2006.V.3	Viverone	Viverone2A	424549	5028953
P_vitosus	Pe	R	2004.VI.16	Monate	Monate	473629	5071882
Acalcarella_spA	L	R	1990.IX.16	Mignone	Arrone	776160	4653385
P_nigritulum	Pe	R	2004.VII.30	GardaBrescia	Garda13Toscolan o15	626127	5054418
P_laminatum	M	R	2004.V.20	TicinoMilano	TicCast5	482342	5037704
P_mikianum	Pe	R	1979.IX.8	Pisgana	Oglio	607753	5121442
P_camptolabis	Pe	R	2004.V.20	MaggioreVares e	Magg45Castellet oTicino	469336	5063754
B_tethys	M	R	1981.VII.15	PoPiacenza	DCO62I	567578	4993863
B_zabolotzskyi	MPe	R	1979.IX.4	PoPiacenza	DCO22A	570493	4992088
H_angularis	M	R	1981.IV.23	PoCremona	CRTNconcanavig	571269	4993342
H_curtilamellata	Pe	R	1978.IX.21	PoPiacenza	DCO22A	570493	4992088
H_fuscimanus	M	R	1986.V.8	MantovaMezzo	Mantovamezzo	641730	5002600
C_albofasciatus	M	R	1986.V.20	MantovaSup	MantovaBesutti	641545	4999432
C_defectus	Pe	R	2004.VI.7	Varese	VareseBiandronn o	479906	5073420
C_obreptans	Pe	R	2004.VII.12	Varese	VareseSchiranna	483302	5071733
C_rostratus	MPe	R	1981.I.15	PoPiacenza	IsSerafinidispositi vo	571168	4993426
C_supplicans	MPe	R	1978.I.18	PoPiacenza	IsSerafinidispositi vo	571168	4993426
Saetheria_reissi	PeM	R	1986.VIII.6	PotenzaMacera ta	Potenza13	878102	4818597
C_macrocera	L	F	1978.-.-	PoPiacenza	DCO22A	570493	4992088
R_demeijrei	MPeL	R	1980.VII.14	PoPiacenza	DCO92G	575998	4997271
Robackia_spA	Pe	R	1980.IX.15	PoPiacenza	DCO22L	570493	4992088
D_vulneratus	Pe	R	2004.VII.30	GardaBrescia	Garda19bManerb a05b	623421	5045622

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## REFERENCES

- Bezzi, M. (1918) Studi sulla ditterofauna nivale delle Alpi italiane. *Memorie della Società Entomologica Italiana*, 9, 1–164.
- Bitušik, P. & Trnková, K. (2019) A preliminary checklist of Chironomidae (Diptera) from Albania with first records for the Balkan Peninsula. *Zootaxa*, 4563, 361–371. DOI: 10.11646/zootaxa.4563.2.9

- Boggero, A., Ruocco, M., Shokri, M., Gjoni, V., Ansaloni, I., Zaupa, S., Montagna, M. & Rossaro, B. (2017) *Chironomus (Chironomus) aprilius* Meigen 1818, 1<sup>st</sup> record from Italy: Cytotaxonomy and ecology. *Redia*, 100, 11–17. DOI: 10.19263/REDIA-100.17.02
- Boorman, J., Coluzzi, M., Contini, C., Ferrarese, U., Rivosecchi, L., Rossaro, B., Sabatini, A. & Wagner, R. (1995) Diptera Culicomorpha. In: Checklist delle specie della fauna italiana (ed. by A. Minelli, S. Ruffo, and S. La Posta), 65, 1–32. Calderini, Bologna.
- Brundin, L. (1966) Transantarctic relationships and their significance, as evidenced by Chironomid midges. *Kungliga Svenska Vetenskaps-Akademiens Handlingar*, 11, 1–472.
- Chattopadhyay, S. (2000) A new record and a redescription of *Polypedilum pruina* Freeman (Diptera: Chironomidae) with a key to Indian species associated with rice fields. *Zoos' Print Journal*, 15, 217–220. DOI: 10.11609/JoTT.ZPJ.15.3.217-20
- Cranston, P.S. & Krosch, M.N. (2015) DNA sequences and austral taxa indicate generic synonymy of *Paratrichocladius* Santos-Abreu with *Cricotopus* Wulp (Diptera: Chironomidae). *Systematic Entomology*, 40, 719–732. DOI: 10.1111/syen.12130
- Cranston, P.S., Hardy, N.B. & Morse, G.E. (2012) A dated molecular phylogeny for the Chironomidae (Diptera). *Systematic Entomology*, 37, 172–188. DOI: 10.1111/j.1365-3113.2011.00603.x
- Cranston, P.S., Martin, J. & Spies, M. (2016) Cryptic species in the nuisance midge *Polypedilum nubifer* (Skuse) (Diptera: Chironomidae) and the status of *Tripedilum* Kieffer. *Zootaxa*, 4079, 429–447. DOI: 10.11646/zootaxa.4079.4.3
- de Jong, Y., Verbeek, M., Michelsen, V., et al. (2014) Fauna Europaea - all European animal species on the web. *Biodiversity Data Journal*, 2, e4034. DOI: 10.3897/BDJ.2.e4034
- Ferrarese, U. (1982) Chironomid research in Italy. *Chironomus*, 2, 29–33.
- Ferrarese, U. (1983) Chironomidi, 3 (Diptera: Chironomidae: Tanypodinae) In: Guide per il riconoscimento delle specie animali delle acque interne italiane (ed. by S. Ruffo), 26, 67 pp. Consiglio Nazionale delle Ricerche AQ/1/204, Verona.
- Ferrarese, U. (1992) Chironomids of Italian rice fields. *Netherlands Journal of Aquatic Ecology*, 26, 341–346.
- Ferrarese, U. & Rossaro, B. (1981) Chironomidi, 1 (Diptera: Chironomidae: Generalità, Diamesinae, Prodiamesinae) In: Guide per il riconoscimento delle specie animali delle acque interne italiane (ed. by S. Ruffo), 12, 97 pp. Consiglio nazionale Ricerche AQ/1/129, Verona.
- Ferrarese, U. & Rossaro, B. (2001) Fascicolo 65 – Diptera Culicomorpha In: Aggiornamenti alla Checklist delle specie della fauna italiana IV contributo (ed. by F. Stoch and S. Zoia), *Bollettino della Società entomologica Italiana*, 133, 85–92.
- Ferrington, L.C. & Sæther, O.A. (2011) A revision of the genera *Pseudosmittia* Edwards, 1932, *Allocladius* Kieffer, 1913, and *Hydrosmittia* gen. n. (Diptera: Chironomidae, Orthocladiinae). *Zootaxa*, 2849, 1–314.
- Fittkau, E.J. & Reiss, F. (1978) Chironomidae. In *Limnofauna Europea* (ed. by J. Illies), pp. 404–440. G. Fischer, Stuttgart.
- Freeman, P. (1957) A study of the Chironomidae (Diptera) of Africa South of the Sahara. III. *Bulletin of the British Museum (Natural History) Entomology* 5, 323–426.
- Fu, Y., Sæther, O.A. & Wang, X. (2012) A review of *Paratrichocladius* Santos Abreu from the Sino-Indian Region (Diptera: Chironomidae: Orthocladiinae). *Zootaxa*, 3478, 453–482.
- Griffiths, G. (2006) Pattern and process in the ecological biogeography of European freshwater fish. *Journal of Animal Ecology*, 75, 734–751
- Hirvenoja, M. (1973) Revision der Gattung *Cricotopus* van der Wulp und ihrer Verwandten (Diptera, Chironomidae). *Annales Zoologici Fennici*, 10(1), 1–363.
- Illies, J. (1978) *Limnofauna Europaea*, 2nd edn. Gustav Fischer Verlag, Stuttgart.
- Laville, H. & Serra-Tosio, B. (1996) Additions et corrections à l'inventaire des Chironomidés (Diptera) de France depuis 1990. *Annales de Limnologie*, 32, 115–121.

- Makarchenko, E.A. & Makarchenko, M.A. (2003) A new and little known species of *Stilocladius* Rossaro, 1979 (Diptera, Chironomidae, Orthoclaadiinae) from the Russian Far East. *Euroasian Entomological Journal*, 2, 135–140
- Makarchenko, E.A. & Makarchenko, M.A. (2007) A review of *Tokunagaia* Sæther (Diptera: Chironomidae) from the Russian Far East, with the description of four new species. In: *Contributions to the Systematics and Ecology of Aquatic Diptera-A Tribute to Ole A. Sæther*, 2006 (ed. by T. Andersen), pp. 181–192. The Caddis Press.
- Marcuzzi, G. (1949) Contributions to the knowledge of Tendipedidae of Padova and Venice. *Hydrobiologia*, 1, 183–209.
- Montagna, M., Urbanelli, S. & Rossaro, B. (2016a) The species of the genus *Diamesa* (Diptera, Chironomidae) known to occur in Italian Alps and Apennines. *Zootaxa*, 4193, 317–331.
- Montagna, M., Mereghetti, V., Lencioni, V. & Rossaro, B. (2016b) Integrated taxonomy and DNA barcoding of alpine midges (Diptera: Chironomidae). *PloS One*, 11, e0149673. DOI: 10.1371/journal.pone.0149673; 20 pp.
- Moubayed, Z. & Laville, H. (1983) Les Chironomidés (Diptera) du Liban. I. Premier inventaire faunistique. *Annales de Limnologie*, 19, 219–228.
- Moubayed-Breil, J. & Ashe, P. (2012) An updated checklist of the Chironomidae of Corsica with an outline of their altitudinal and geographical distribution (Diptera). *Ephemera*, 13, 13–39.
- Nocentini, A. (1985) Chironomidi, 4 (Diptera: Chironomidae: Chironominae, larve) In: *Guide per il riconoscimento delle specie animali delle acque interne italiane* (ed. by S. Ruffo), 29, pp. 186. Consiglio Nazionale delle Ricerche AQ/1/233, Verona.
- Orendt, C., Garcia, X.F., Janecek, B.F., Michiels, S., Otto, C.J. & Müller, R. (2014) Faunistic overview of Chironomidae (Insecta: Diptera) in lowland running waters of north-east Germany (Brandenburg) based on 10-year EU-Water Framework Directive monitoring programme. *Lauterbornia*, 77, 37–62.
- Paasivirta, L. (2014) Checklist of the family Chironomidae (Diptera) of Finland. *ZooKeys*, 441, 63–90. [for Errata and Addenda (2017), see <http://dipteratyoryhma.myspecies.info/fi/content/checklist-errata-addenda>]. DOI: 10.3897/zookeys.441.7461
- Plóciennik, M. & Pešic, V. (2012) New records and list of non-biting midges (Chironomidae) from Montenegro. *Biologica Serbica* 34, 36–50.
- Plóciennik, M., Gadawski, P. & Kazimierczak, J. (2014) New records of non-biting midges from coastal regions of Croatia and Montenegro (Diptera, Chironomidae). *Spixiana*, 37, 89–92.
- Plóciennik, M., Dmitrovic, D., Pešic, V. & Gadawski, P. (2016) Ecological patterns of Chironomidae assemblages in Dinaric karst springs. *Knowledge and Management of Aquatic Ecosystems*, 417, 11. DOI: 10.1051/kmae/2015044.
- Prat, N. (1979) Quironòmidos de los embalses espanoles (1 a parte). *Graellsia*, 33, 37–96.
- Prat, N. (1980) Quironòmidos de los embalses espanoles (2 a parte). *Graellsia*, 34, 59–119.
- Reiss, F. (1968) Verbreitung lakustrischer Chironomiden (Diptera) des Alpengebietes. *Annales Zoologici Fennici*, 5, 119–125.
- Reiss, F. (1977) Verbreitungsmuster bei paläarktischen Chironomidenarten (Diptera, Chironomidae). *Spixiana*, 1, 85–97.
- Reiss, F. (1985) A contribution to the zoogeography of the Turkish Chironomidae (Diptera). *Israel Journal of Entomology*, 19, 161–170.
- Reiss, F. (1986a) Ein Beitrag zur Chironomidenfauna Syriens (Diptera, Chironomidae). *Entomofauna*, 7, 153–168.
- Reiss, F. (1986b) Erster Nachtrag zur Chironomidenfauna Bayerns (Diptera, Chironomidae). *Spixiana*, 9, 175–178.
- Roback, S.S. (1971) The adults of the subfamily Tanypodinae (= Pelopiinae) in North America (Diptera: Chironomidae). *Monographs of the Academy of Natural Sciences of Philadelphia*, 17, 1–410.
- Rossaro, B. (1979) Contributo alla conoscenza delle Orthoclaadiinae e Diamesinae italiane (Diptera, Chironomidae) (seconda nota). *Bollettino del Museo Civico di Storia Naturale, Verona*. 6, 79–94.

- Rossaro, B. (1982a) Chironomidi, 2 (Diptera: Chironomidae: Orthocladiinae). In: Guide per il riconoscimento delle specie animali delle acque interne italiane (ed. by S. Ruffo), 16, 80 pp. Consiglio Nazionale delle Ricerche AQ/1/171, Verona.
- Rossaro, B. (1982b) Description of *Stenochironomus ranzii* n. sp. from Po River (Italy) (Diptera, Chironomidae). Bollettino della Società entomologica italiana, 114, 179–182.
- Rossaro, B. (1984) *Stilocladius* Rossaro, 1979 reconsidered, with descriptions of the female and larva of *S. montanus* Rossaro (Diptera: Chironomidae, Orthocladiinae). Entomologica Scandinavica, 15, 185–191.
- Rossaro, B. (1988) A Contribution to the knowledge of Chironomids in Italy (Diptera, Chironomidae). Spixiana Supplement, 14, 191–200.
- Rossaro, B. (1992a) Chironomids collected in the western and central Alps (Diptera: Chironomidae). Studi Trentini di Scienze Naturali, Acta Biologica, 67, 181–195.
- Rossaro, B. (1992b) Revision of the genus *Paratrithocladius* Santos-Abreu, 3rd note: Description of a new species: (Diptera Chironomidae Orthocladiinae). Bollettino della Società Entomologica Italiana, 123, 234–238.
- Rossaro, B. (1995) The distribution of Palaearctic Diamesinae (Insecta, Diptera, Chironomidae). Spixiana, 18, 177–186.
- Rossaro, B. (2017) *Boreoheptagyia ortladamellica* sp. nov. (Diptera, Chironomidae) from Italian Alps. Journal of Entomological and Acarological Research, 49.6860,77–80. DOI: 10.4081/jear.2017.6860.
- Rossaro, B. & Lencioni, V. (2000) Revision of the genus *Smittia* Holmgren, 1869 (Diptera Chironomidae Orthocladiinae), 2nd note. Bollettino di Zoologia Agraria e Bachicoltura, Ser. II 32, 97–105.
- Rossaro, B. & Cortesi, P. (2013) The effects of tricyclazole treatment on aquatic macroinvertebrates in the field and in laboratory. Journal of Entomological and Acarological research, 45e23, 128–136. DOI: 10.4081/jear.2013.e23.
- Rossaro, B. & Lencioni, V. (2015) A key to larvae of *Diamesa* Meigen, 1835 (Diptera, Chironomidae), well known as adult males and pupae from Alps (Europe). Journal of Entomological and Acarological Research, 47(3), 123–138. DOI: 10.4081/jear.2015.5516.
- Rossaro, B., Lencioni, V. & Casalegno, C. (2003) Revision of West Palaearctic species of *Orthocladius* s. str. van der Wulp, 1874 (Diptera: Chironomidae: Orthocladiinae), with a new key to species. Studi Trentini di Scienze Naturali, Acta Biologica, 79, 213–241.
- Rossaro, B., Montagna, M. & Lencioni, V. (2016) Environmental traits affect chironomid communities in glacial areas of the Southern Alps: evidence from a long-lasting case study. Insect Conservation and Diversity, 9, 192–201.
- Rossaro, B., Magoga, G. & Montagna, M. (2017) Revision of the genus *Chaetocladius* Kieffer (Diptera, Chironomidae), 1st note: description of four new species from Italy. Journal of Entomological and Acarological Research, 49, 36–47, DOI: 10.4081/jear.2017.6658
- Rossaro, B., Lencioni, V., Boggero, A. & Marziali, L. (2006) Chironomids from Southern Alpine running waters: ecology, biogeography, Hydrobiologia, 562, 231–246. DOI: 10.1007/s10750-005-1813-x
- Sæther, O.A. & Sublette, J. E. (1983) A review of the genera *Doithrix* n. gen., *Georthocladius* Strenzke, *Parachaetocladius* Wülker and *Pseudorthocladius* Goetghebuer (Diptera: Chironomidae, Orthocladiinae). Entomologica Scandinavica Supplement, 20, 100 pp.
- Serra-Tosio, B. (1973) Ecologie et biogéographie des Diamesini d'Europe (Diptera, Chironomidae). Travaux Laboratoire Hydrobiologie, Grenoble, 63, 5–175.
- Serra-Tosio, B. (1983) Nouveaux Diamesinae de la Paléarctide méridionale et orientale. Spixiana, 6, 1–26.
- Serra-Tosio, B. & Laville, H. (1991) Liste annotée des Diptères Chironomidés de France continentale et de Corse. Annales de Limnologie, 27, 37–74.
- Spies, M. & Sæther, O.A. (2004) Notes and recommendations on taxonomy and

- nomenclature of Chironomidae (Diptera). Zootaxa, 752, 1-90.
- URL 1: <http://www.faunaitalia.it/checklist/invertebrates/families/Chironomidae.html>
- URL 2: <http://www.chironomidae.net/chklists/Swisslist.html>
- URL 3: [http://www.chironomidae.net/chklists/chiolis\\_france.html](http://www.chironomidae.net/chklists/chiolis_france.html)
- URL 4: <http://www.chironomidae.net/chklists/Checklist%20of%20Far%20Eastern%20Chironomidae.html#Tanypodinae>
- URL 5: <https://fauna-eu.org/>
- Wallace, G.S., Mabee, W.R. & Combes, M.D. (2009) Range extension of a nonindigenous midge, *Polypedilum nubifer* (Diptera: Chironomidae), in North America. Southeastern Naturalist, 8, 559–562. DOI: 10.1656/058.008.0319
- Wang, X. (1998) Description of a new species of *Stilocladius* from China (Diptera: Chironomidae). Studia Dipterologica, 5, 81–83.
- Wirth, W.W. & Marston, N. (1968) A method for mounting small insects on microscope slides in Canada Balsam. Annals Entomological Society America, 61, 783–78.

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