



The genus *Hydroptila* Dalman 1819 in Italy: Ecology and morphology

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Abstract

The 27 *Hydroptila* species listed as of 2012 in Italy were found in 434 biotopes located in lotic and lentic waters of the Italian mainland regions and islands (Sicilia, Sardegna, Capraia, Elba). The richest regions are Umbria (15 species), Toscana and Piemonte. The most widespread species are *H. vectis*, found in 18 regions and *H. angulata* found in 16 regions. *Hydroptila fiorii*, *H. serrata* and *H. cortensis* were found only in Sardegna, the latter only in one site. *Hydroptila tacheti* was found only in Friuli-Venezia Giulia. No *Hydroptila* species were found in Valle d'Aosta. Four species are endemic to the Italian fauna (*H. cortensis*, *H. fiorii*, *H. ruffoi*, *H. stellifera*). The main ecological parameters of *Hydroptila* spp. collection sites are discussed. The organization of scent organs in male *H. aegyptia* was examined by means of light and electron microscopy. Finally, an updated catalogue of the Italian species is reported.

Key words: collection sites, ecological parameters, cephalic scent organs, catalogue

Introduction

In Italy, after *Rhyacophila* (35 species), the genus *Hydroptila* is the richest genus in number of species. As of 2012, 27 species have been found in lotic and lentic waters in the Italian peninsula and islands (Sicilia, Sardegna, Capraia and Elba). Four of these (*H. cortensis*, *H. fiorii*, *H. ruffoi*, *H. stellifera*) are endemic to the Italian fauna (Corallini *et al.* 2013, in press).

The first recording of *Hydroptila* in Italy was by Costa (1871). The next collections were made by Eaton in 1873 (McLachlan 1874–1880) in Lake Como (Lombardia), in 1882 in Appennino Pistoiese (Toscana) (Malicky & Moretti 1987), in 1884 in Adda river (Lombardia) by Ghiliani and in 1935 by Moretti (Moretti 1937). Beginning in 1951, species of *Hydroptila* were collected in several sites in watercourses, lakes and marshes in Marche and Umbria by undergraduate students of the *Istituto di Zoologia* of the *Università degli Studi di Camerino* (Morrone 1951–52; Lazzerini 1951–52, Antognelli 1952–53; Formicone 1952–53; Testa 1953–54) and students of the *Istituto di Zoologia* of the *Università degli Studi di Perugia* (Gammaitoni 1965–66; Giovagnoni 1966–67; Ridolfi 1966–67; Portarena 1967–68; De Bartolomeo 1969–70; Boriosi 1970–71; Marri 1970–71; Cardellini 1970–71; Corrado 1970–71; Alessandri 1970–71; Valeri 1971–72; Scalise 1972–73; Malena 1978–79; Truffini 1978–79; Piottoli 1979–80; Peroni 1982–83; Ronca 1982–83; Selvi 1983–84; Baviera 1985–86; Fabbri 1986–87; Azara 1988–89; Pignatari 1988–89; Romozzi 1989–90; Berdini 1990–91; Capoccia 1990–91; Cruccolini 1990–91; Mazzerioli 1993–94; Meniconi 1993–94; Montanucci 1994–95; Romano 1994–95; Annese 1995–96; Fucchi 1995–96, Giovannini 1995–96; Iorio 1995–96; Marchetti 1996–97; Todini 1997–98; Beco 1999–2000). Researchers (Buda Damcevich, Carchini, Desio, De Pietro, Fochetti, Gerecke, Heiss, Letardi, Osella, Ravizza, Riggio) and Moretti and collaborators (Chiappafreddo, Cianficconi, Corallini, Gianotti, Marinelli, Pirisinu, Salerno, Taticchi, Tucciarelli, Viganò) collected *Hydroptila* species in several Italian regions. Subsequently, adult and aquatic stage specimens,

classified by Moretti, were reported in the Catalogue of the Moretti Collection (Di Giovanni et al. 2004). Some species of *Hydroptila*, especially in the northern Italian regions, were found by Malicky (2002, 2004, 2005 and *in litt.* 2001, 2012), Valle (2001) and Bertuetti *et al.* (2004, 2005).

Morphological and histological studies (Moretti & Cianficconi 1964a, 1964b) and, eventually, ultrastructural studies (Moretti & Bicchierai 1979) on the Italian *Hydroptila* were made at the *Istituto di Zoologia* of the *Università degli Studi di Perugia*.

In this paper the relationship between *Hydroptila* species found in Italy and ecological factors, such as altitude and water physico-chemical parameters, are examined. In addition, the morphology, histology and ultrastructure of the cephalic glands in male *Hydroptila aegyptia* are investigated. Finally, an updated catalogue of the Italian species is reported.

Materials and methods

The specimens were collected randomly or seasonally in the Italian peninsula and Islands to prepare graduation theses. Some biotopes were investigated in more than one section along watercourses and some sites checked more than once in different years. The aquatic stages, collected with a hand net or with tweezers according to the habitat and typology of the substrate, were fixed in formol 7% and partly reared in the laboratory until the emergence of the adults. The adults were collected mainly in daylight with an entomological net and a micro-aspirator in the surrounding vegetation. Only in recent times the specimens have been collected with light traps during the night. Some specimens were fixed in 70% alcohol and others were taken alive to the laboratory for dry conservation. Some larvae were reared in captivity in order to study the biological cycle of the respective species.

Morphological, histological and ultrastructural investigations were made by means of light and electron microscopes.

Light microscopy: Larval heads of male *H. aegyptia* were dissected and fixed for 2 hours in Bouin fluid. Section, 2-3 μm thick were stained with Carazzi hematoxylin-eosin. Semi-thin sections, about 1 μm thick, of the material prepared for transmission electron microscopy were stained in 1% methylene blue in 1% borax, then observed and photographed with a Leitz Dialux 22 phase contrast microscope.

Transmission electron microscopy (TEM): Larval heads of male *H. aegyptia* were dissected and fixed for 2h at 4°C in glutaraldehyde 2.5% in 0.1M cacodylate buffer (pH 7.2), rinsed in the buffer, post-fixed for one hour in 1% osmium tetroxide in the same buffer and dehydrated in a graded ethanol series. The material was infiltrated with propylene oxide, embedded in an Epon-Araldite mixture, and polymerized at 60°C. Thin sections, obtained with a Reichert Ultracut OM U3 microtome, were placed on formvar coated copper grids, stained with uranyl acetate and lead citrate, and observed with a Philips EM 400.

Scanning electron microscopy (SEM): Larval heads of male *H. aegyptia* were fixed, post-fixed and dehydrated as for TEM. Critical point drying was performed in a Balzers CPD 020 apparatus with carbon dioxide. Specimens were mounted on stubs, coated with gold-palladium and examined with a Philips SEM 505 scanning electron microscope.

Results

Collection sites

The number of *Hydroptila* species and the number of collection sites of both Trichoptera species and *Hydroptila* species in the Italian regions and islands (Sicilia, Sardegna, Capraia, Elba) are reported in Figure 1. The *Hydroptila* collection sites, organized according to the Italian regions, are listed in Table 1, each with the name, location and altitude of its biotopes. The lotic biotopes include hygropetric habitats, springs, brooks, streams, rivers, canals and tributaries; lentic biotopes include lakes of different origins, marshes and peat bogs.

From 1873 to 2012, there have been 27 species of *Hydroptila* found in Italy in 434 sites which represent 9.6% of the 4513 Trichoptera collection sites in Italy. The percentage ratio of the number of *Hydroptila* collection sites to number of Trichoptera collection sites in each region is higher in Umbria (22%), Puglia (16.6%), and Sardegna (16%) and lower in Trentino Alto Adige (0.5%), Abruzzo (1.36%), and Molise (2.86%). No *Hydroptila* species have been found in Valle d'Aosta (Fig. 2).



FIGURE 1. Map of Italian regions, with number of *Hydroptila* species, number of *Hydroptila* collection sites (bold), and number of Trichoptera collection sites (underlined) for each region.

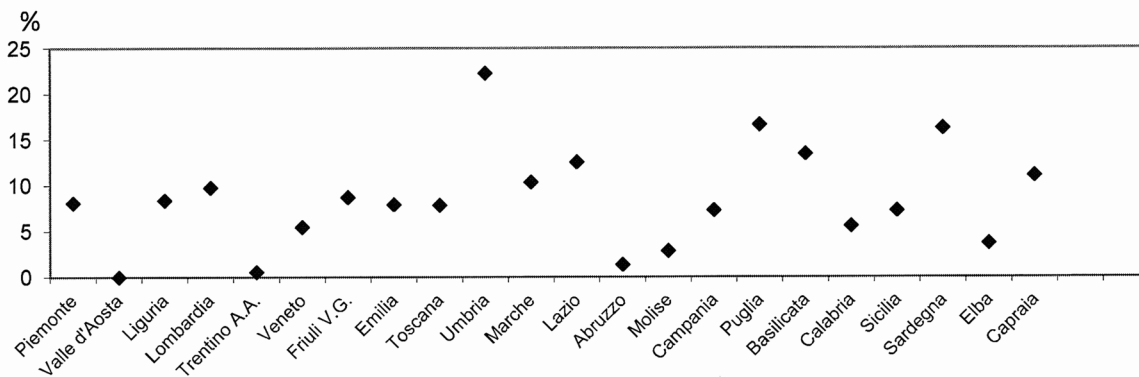


FIGURE 2. Percentage ratio of *Hydroptila* collection sites to Trichoptera collection sites in each region.

TABLE 1. The *Hydroptila* ssp. collection sites, organized according to their Italian regions, each listed with the name, location and altitude of its biotope. L=lake; R=river; T=torrent

Piemonte

- 001–R. Po, viadotto, Oncino 900 m a.s.l.
002–R. Po, Ponte Po, Carignano 230 m a.s.l.
003–R. Po, Mezzi Po, Gassino Torinese, 195 m a.s.l.
004–R. Po, m a.s.l.ezzi Po 194 m a.s.l.
005–R. Po, Rocca delle Donne, P. Vercellese 128 m a.s.l.
006–R. Po, Garzaia 90 m a.s.l.
007–R. Po, Valenza Po 90 m a.s.l.
008–R. Po, Isola S. Antonio, Mezzana Bigli 70 m a.s.l.
009–R. Stura 370 m a.s.l.
010–Triburary of R. Stura di Demonte, Fossano 365 m a.s.l.
011–R. Stura di Lanzo, La Mandria, Torino 210 m a.s.l.
012–R. Tanaro 124 m a.s.l.
013–Brook Rio Meri, at confluence with L. Ortoglieto 300 m a.s.l.
014–Brook, Ponzzone 500 m. a.s.l.
015–T. Scrivia, Arquata 258 m a.s.l.
016–T. Scrivia, Tortona 122 m a.s.l.
017–T. Erro, Cartosio 250 m a.s.l.
018–T. Maira 600 m. a.s.l.
019–T.Orba, Ovada 186 m a.s.l.
020–Spring brook, Fossano 370 m a.s.l.

Liguria

- 001–Brook, Vignai 740 m a.s.l.
002–Torrent in Ponte dei Passi, Rezzo 700 m a.s.l.
003–Torrent in Passo del Ginestro 677 m a.s.l.
004–Torrent in Giara di Rezzo 400 m a.s.l.
005–R. Lerrone, Casanova 150 m a.s.l.
006–R.Vara, Beverino 70 m a.s.l.
007–R. Magra, ponte SS 1, Sarzana 10 m a.s.l.
008–Brook Rio Malla, Andora 10 m a.s.l.
009–Brook Rio Sanguaneo, Casanova 150 m a.s.l.

Lombardia

- 001–R. Adda, Morta del Toffo, Brivio 196 m a.s.l.
002–R. Adda, Morta di Arlate, Brivio 196 m a.s.l.
003–R. Adda, Mulino di Sotto, Villa d'Adda 196 m a.s.l.
004–R. Lario, Mandello Lario 214 m a.s.l.
005–R. Oglio, Palazzolo sull'Oglio 169 m a.s.l.
006–R. Oglio, Calcio 100 m a.s.l.
007–R. Po, Cava Manara 70 m a.s.l.
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TABLE 1. (Continued)

008–R. Po, Mezzana Corti 59 m a.s.l.
009–R. Po, San Rocco al Porto 50 m a.s.l.
010–R. Po, Somaglia 45 m a.s.l.
011–R. Po, Borgoforte 44 m a.s.l.
012–R. Po, Sabbioncello, Quingentole 18 m a.s.l.
013–R. Serio, Zanica 190 m a.s.l.
014–R. Serio, Mozzanica 100 m a.s.l.
015–Spring, Monasterolo del Castello 600 m a.s.l.
016–Spring, Campo dei Fiori, Mozzanica 94 m a.s.l.
017–Spring Prati, Fontanella 95 m a.s.l.
018–Inlet L. Endine Gaiano 430 m a.s.l.
019–L. Endine, Monasterolo del Castello 334m a.s.l.
020–L. Como, Bellagio 217 m a.s.l.
021–L. Piona Lario 217 m a.s.l.
022–L. Garda, San Felice Benaco 64 m a.s.l.
023–L. Garda, Gargnano 64 m a.s.l.
024–L. Garda, Sirmione 64 m a.s.l.
025–L. Iseo, Punta del Tufo, Parzanica 190 m a.s.l.
026–Canal Vaschepine, Caravaggio 118 m a.s.l.
027–Canal Forcone, Casirate d’Adda 105 m a.s.l.
028–Canal Alchina, Mozzanica 96 m a.s.l.
029–Brook, Trevasco-Nembro 525 m a.s.l.
030–Hygropetric, S. Giovanni Bianco-Cantalto 450 m a.s.l.
031–Solto Collina, Valle del Ferro 420 m a.s.l.
032–T. Roasco, Grosio 700 m a.s.l.
033–T. Zu, Riva di Solto 200 m a.s.l.
034–Val Vertova 397 m a.s.l.

Trentino Alto Adige

001–Torrent in Caldaro 214 m a.s.l.

Veneto

001–R. Adige, Verona 59 m a.s.l.

002–R. Po, Papozze 5 m a.s.l.

003–L. Garda, Malcesine 89 m a.s.l.

Friuli Venezia Giulia

001–Canal in Somplago 220 m a.s.l.

002–R. Tagliamento, Cornino 460 m a.s.l.

003–R. Tagliamento, Cornino 180 m a.s.l.

004–Vivaro, Pordenone 138 m a.s.l.

005–Resurgence pools Vinchiaruzzo, Cordenons 38 m a.s.l.

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TABLE 1. (Continued)

- 006–Springs in Lusevera 330 m a.s.l.
007–T. Resia, Valle Resia 400 m a.s.l.
008–T. Torre, S. Osvaldo 71 m a.s.l.
009–Peat bog in Lazzacco, Pagnacco 170 m a.s.l.

Emilia Romagna

- 001–R. Panaro, Vignola 125 m a.s.l.
002–R. Po, Pievetta 55 m a.s.l.
003–R. Po, Corso 42 m a.s.l.
004–R. Po, Castelvetro Piacentino 35 m a.s.l.
005–R. Po, Sissa 30 m a.s.l.
006–R. Po, Bardella 6 m a.s.l.
007–Ponte Samone, Guiglia 490 m a.s.l.

Toscana

- 001–R. Bardine, 140 m a.s.l.
002–R. Bardine, Tendola-Ceserano 90 m a.s.l.
003–R. Cecina, Cecina 30 m a.s.l.
004–R. Fiora, Manciano-Scarceta 160 m a.s.l.
005–R. Limentra, Passo della Collina 935 m a.s.l.
006–R. Magra, Aulla 40 m a.s.l.
007–R. Magra 10 m a.s.l.
008–R. Paglia, Burburigo 300 m a.s.l.
009–R. Serchio di Castelnuovo 220 m a.s.l.
010–R. Singerna, Montalone 860 m a.s.l.
011–R. Tevere, Molinaccio 553 m a.s.l.
012–R. Tevere, Cercetole 500 m a.s.l.
013–R. Tevere, Pieve S.Stefano 431 m a.s.l.
014–R. Tevere, Formoli 405 m a.s.l.
015–R. Tevere, S.Sepolcro 305 m a.s.l.
016–Hygropetric Laonda-San Lorino 226 m a.s.l.
017–L. Chiusi 251 m a.s.l.
018–L. Massacciuccoli 1 m a.s.l.
019–T. Aulella 95 m a.s.l.
020–T. Aulella, Rometta-Pollerone 74 m a.s.l.
021–R. Cananecchia, Val Savignone 520 m a.s.l.
022–T. Lucido 650 m a.s.l.
023–T. Molinello, Pontremoli 400 m a.s.l.
024–T. Pagliola 700 m a.s.l.
025–T. Pesciola, S.Terenzo-Bardine 150 m a.s.l.
026–T. Singerna 860 m a.s.l.
027–T. Turrice Secca, Campagrina 820 m a.s.l.
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TABLE 1. (Continued)

028–Torrent in Acquerino-Collina 423 m a.s.l.

029–Traballa, Cadenzano 75 m a.s.l.

Umbria

001–Marmore falls, Terni 295 m a.s.l.

002–Colfiorito north marshes 758 m a.s.l.

003–Colfiorito marshes, sinkhole 758 m a.s.l.

004–Colfiorito west marshes 758 m a.s.l.

005–R. Chiascio, Corraduccio 370 m a.s.l.

006–R. Chiascio, Branca, Gubbio 365 m a.s.l.

007–R. Chiascio, Ponte Nuovo 155 m a.s.l.

008–R. Menotre 298 m a.s.l.

009–R. Menotre, Rasiglia 654 m a.s.l.

010–R. Menotre, Pale 467 m a.s.l.

011–R. Nera, Belforte 450 m a.s.l.

012–R. Nera, Cerreto di Spoleto 380 m a.s.l.

013–R. Nera, Borgo Cerreto 357 m a.s.l.

014–R. Nera, Piedipaterno 340 m a.s.l.

015–R. Nera, Scheggino 310 m a.s.l.

016–R. Nera, Scheggino 300 m a.s.l.

017–R. Nera, Narni 125 m a.s.l.

018–R. Nera, Stifone 80 m a.s.l.

019–R. Nera, Orte 50 m a.s.l.

020–R. Nestore, Monteleone d'Orvieto 475 m a.s.l.

021–R. Nestore, Piegaro 260 m a.s.l.

022–R. Nestore, Piegaro 236 m a.s.l.

023–R. Nestore, Piegaro 234 m a.s.l.

024–R. Nestore, Enel 232 m a.s.l.

025–R. Nestore, 217 m a.s.l.

026–R. Nestore, 210 m a.s.l.

027–R. Nestore, 200 m a.s.l.

028–R. Nestore, Morcella 190 m a.s.l.

029–R. Nestore, Marsciano 160 m a.s.l.

030–R. Paglia, Ponte Gregoriano 245 m a.s.l.

031–R. Paglia, Fonti di Tiberio 150 m a.s.l.

032–R. Paglia, 119 m a.s.l.

033–R. Paglia, Ciconia 117 m a.s.l.

034–R. Paglia, 109 m a.s.l.

035–R. Paglia, 7 Martiri, Orvieto 104 m a.s.l.

036–R. Paglia, S. Paolo 95 m a.s.l.

037–R. Sentino, Ponte Calcara 560 m a.s.l.

038–R. Sentino, Molino delle Ogne 540 m a.s.l.

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TABLE 1. (Continued)

039–R. Sordo, Norcia 600 m a.s.l.
040–Spring S. Girolamo, Orticoli 290 m a.s.l.
041–R. Tevere, Selci Lama 290 m a.s.l.
042–R. Tevere, Città di Castello 280 m a.s.l.
043–R. Tevere, Città di Castello 275 m a.s.l.
044–R. Tevere, Canonica 274 m a.s.l.
045–R. Tevere, Trestina 260 m a.s.l.
046–R. Tevere, Umbertide 259 m a.s.l.
047–R. Tevere, Pierantonio 247 m a.s.l.
048–R. Tevere, Badia di Montecorona 240 m a.s.l.
049–R. Tevere, Ponte Pattoli 210 m a.s.l.
050–R. Tevere, Ponte San Giovanni 190 m a.s.l.
051–R. Tevere, Ponte Nuovo 180 m a.s.l.
052–R. Tevere, 160 m a.s.l.
053–R. Tevere, 159 m a.s.l.
054–R. Tevere, Montemolino 140 m a.s.l.
055–R. Tevere, Ponterio-Todi 139 m a.s.l.
056–R. Tevere, Todi 138 m a.s.l.
057–R. Tevere, T. Naia 136 m a.s.l.
058–R. Tevere, Tevere Morto 135 m a.s.l.
059–R. Tevere, Pontecuti 134 m a.s.l.
060–R. Tevere, T.Naia 133 m a.s.l.
061–R. Tevere, 0,2 km to Corbara dam 120 m a.s.l.
062–R. Tevere, near Corbara dam 119 m a.s.l.
063–R. Tevere, 1,5 km to Corbara dam 95 m a.s.l.
064–R. Tevere, confluence with R. Paglia 96 m a.s.l.
065–R. Tevere, 94 m a.s.l.
066–R. Paglia, Baschi-Alviano 80 m a.s.l.
067–R. Tevere, 52 m a.s.l.
068–R. Tevere, 50 m a.s.l.
069–R. Tissino, Cerreto di Spoleto 380 m a.s.l.
070–R. Topino, 395 m a.s.l.
071–R. Topino, 368 m a.s.l.
072–R. Topino, Valtopina 348 m a.s.l.
073–R. Vetorno, Purello-Fossato 530 m a.s.l.
074–Fonti del Clitunno 250 m a.s.l.
075–Brook from Manfroni dam, Sigillo 460 m a.s.l.
076–Brook Sciola, T. Rigo 390 m a.s.l.
077–Spring Aiso 305 m a.s.l.
078–Spring Orbi, Mount Subasio 525 m a.s.l.
079–Artificial lake, Colombella Alta 320 m a.s.l.
080–L. Aiso, Bevagna 310 m a.s.l.

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TABLE 1. (Continued)

081–L. Alviano 80 m a.s.l.
082–L. Corbara 130 m a.s.l.
083–Artificial lake Fassa, Gubbio 415 m a.s.l.
084–L. Artificial lake Monticelli, Gubbio 460 m a.s.l.
085–L. Piediluco, 369 m a.s.l.
086–L. Piediluco, Cornello loop 369 m a.s.l.
087–L. Piediluco, Ara Marina loop 369 m a.s.l.
088–L. Piediluco, Ponticelli loop 369 m a.s.l.
089–L. Piediluco, S. Nicolò loop 369 m a.s.l.
090–L. Piediluco, town 369 m a.s.l.
091–L. Piediluco, Capolozza loop 369 m a.s.l.
092–L. Piediluco, Curiano canal 369 m a.s.l.
093–L. Trasimeno, outlet 258 m a.s.l.
094–L. Trasimeno, Polvese island 258 m a.s.l.
095–L. Trasimeno, canal Anguillara 258 m a.s.l.
096–L. Trasimeno, Passignano 258 m a.s.l.
097–L. Trasimeno, Castiglione del Lago 258 m a.s.l.
098–L. Trasimeno, Maggiore island 258 m a.s.l.
099–L. Trasimeno, Minore island 258 m a.s.l.
100–L. Trasimeno, Monte del Lago 258 m a.s.l.
101–L. Trasimeno, Torricella 258 m a.s.l.
102–L. Trasimeno, S. Arcangelo 258 m a.s.l.
103–L. Trasimeno, Tuoro 258 m a.s.l.
104–Irrigated meadows, Norcia 590 m a.s.l.
105–T. Sanguinone spring, Mount Subasio 780 m a.s.l.
106–T. Caina, brook Rio Vignacce 300 m a.s.l.
107–T. Caina, Santa Lucia 290 m a.s.l.
108–T. Chiani, 230 m a.s.l.
109–T. Chiani, Bagni 150 m a.s.l.
110–T. Chiani, Case Ponte di Ferro 130 m a.s.l.
111–T. Chiani, Ciconia 100 m a.s.l.
112–T. Chiona, Madonna Copernieri 489 m a.s.l.
113–T. Chiona 430 m a.s.l.
114–T. Fersinone, Casaccia 237 m a.s.l.
115–T. Lama 400 m a.s.l.
116–T. Marroggia springs 600 m a.s.l.
117–T. Rasina, S. Antonio 460 m a.s.l.
118–T. Rasina, Cerqueto 440 m a.s.l.
119–T. Rasina, Schifanoia 360 m a.s.l.
120–T. Romealla, Benano 258 m a.s.l.
121–T. Romealla, Orvieto 156 m a.s.l.
122–T. Soara, Sasso 300 m a.s.l.

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TABLE 1. (Continued)

- 123–T. Sorre, Montegabbione 490 m a.s.l.
124–Spring in Parrino, T. Sorre 440 m a.s.l.
125–T. Sorre, Faiolo 280 m a.s.l.
126–T. Sospertole, Schifanoia 410 m a.s.l.

Marche

- 001–R. Burano, Pontedazzo 350 m a.s.l.
002–R. Certano 490 m a.s.l.
003–R. Certano, Pianello 390 m a.s.l.
004–R. Cesano, S. Lorenzo in Campo 200 m a.s.l.
005–R. Chienti, Gelagna Bassa 600 m a.s.l.
006–R. Esinante, S. Urbano Church 230 m a.s.l.
007–R. Esino, S. Elena Abbey 140 m a.s.l.
008–R. Giano, Cancelli 408 m a.s.l.
009–R. Marecchia, Novafeltria 280 m a.s.l.
010–R. Metauro, Cà Lagostina 200 m a.s.l.
011–R. Nera 570 m a.s.l.
012–R. Potenza, Spindoli 455 m a.s.l.
013–R. Potenza, Pioraco 444 m a.s.l.
014–R. Potenza, Pioraco 375 m a.s.l.
015–R. Potenza, Lanciano 322 m a.s.l.
016–R. Potenza, Torre del Parco 310 m a.s.l.
017–R. Potenza, Castelraimondo 285 m a.s.l.
018–R. Potenza, Casteraimondo 280 m a.s.l.
019–R. Potenza, S. Severino Marche 210 m a.s.l.
020–R. Potenza, Passo di Treia 138 m a.s.l.
021–R. Potenza, Villa Potenza 90 m a.s.l.
022–R. Potenza, Sambucheto 70 m a.s.l.
023–R. Potenza, Porto Recanati 1 m a.s.l.
024–R. Tronto, Arquata 690 m a.s.l.
025–R. Tronto, Trisungo 650 m a.s.l.
026–R. Tronto, Ponte d'Arli 300 m a.s.l.
027–R. Tronto, Ponte d'Arli 250 m a.s.l.
028–Fosso di Serradica 457 m a.s.l.
029–Hygropetric at Mount S. Antonio, Bocca Trabaria 1010 m a.s.l.
030–T. Biscubio, Apecchio 450 m a.s.l.
031–T. Scarsito, Sefro 600 m a.s.l.
032–T. Salino, S. Angelo in Pontano 300 m a.s.l.
033–Spring, Sefro 502 m a.s.l.

Lazio

- 001–R. Fiora, Ponte dell'Abbadia 42 m a.s.l.
-

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TABLE 1. (Continued)

- 002–R. Mignone, Farnesina 26 m a.s.l.
003–R. Paglia, Ponte Gregoriano 245 m a.s.l.
004–R. Tevere, a valle F. Nera 48 m a.s.l.
005–R. Tevere, Baucche 47 m a.s.l.
006–R. Tevere, Ponte Turrita 37 m a.s.l.
007–R. Tevere, Ponte Milvio 14 m a.s.l.
008–R. Tevere, Testaccio 8 m a.s.l.
009–R. Velino, Cittareale 980 m a.s.l.
010–R. Velino, Rieti 400 m a.s.l.
011–L. Bolsena, Lavatoro 305 m a.s.l.
012–L. Bolsena, San Magno 305 m a.s.l.
013–L. Bolsena, Capodimonte 305 m a.s.l.
014–L. Bracciano, south shore 164 m a.s.l.
015–L. Bracciano, Bagni 164 m a.s.l.
016–L. Nemi 316 m a.s.l.
017–L. Ninfa, Sermoneta 30 m a.s.l.
018–L. Ripasottile 369 m a.s.l.
019–L. Vico 310 m a.s.l.
020–Canal S. Susanna, Rieti 405 m a.s.l.

Abruzzo

- 001–L. Vetoio outlet 632 m a.s.l.
002–R. Tordino, Notaresco-Teramo 1900 m a.s.l.
003–R. Vera 895 m a.s.l.
004–R. Vomano, Nerito 720 m a.s.l.
005–Pelone spring, Monti della Laga 1500m a.s.l.
006–T. Castellano, Monti della Laga 1070 m a.s.l.

Molise

- 001–R. Cigno, Rosciano 62 m a.s.l.
002–R. Trigno, Trivento 250 m a.s.l.
003–R. Volturno, Colli a Volturno 300 m a.s.l.

Campania

- 001–R. Volturno, Capua 112 m a.s.l.
002–Serre di Persano, Salerno 53 m a.s.l.
003–T. Cervaro, Montaguto 476 m a.s.l.

Puglia

- 001–Canal Brunese, Torre dell'Orso 20 m a.s.l.
002–Canal Lido degli Angeli, Sant'Isidoro 2 m a.s.l.
003–Canal Perlusiglio
-

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TABLE 1. (Continued)

- 004–R. Chidro, S. Pietro in Bevagra 4 m a.s.l.
005–R. Galeso, Statte 10 m a.s.l.
006–R. Tara, Gravina di Leucaspide 5
007–L. Varano, inlet brooks 5 m a.s.l.
008–T. Candelaro 36 m a.s.l.
009–T. Celone, S. Vito 553 m a.s.l.
010–T. Gravina, Gravina di Puglia 300 m a.s.l.

Basilicata

- 001–R. Basento, Calciano 425 m a.s.l.
002–R. Basento, Calciano 250 m a.s.l.
003–R. Mercure, Vigianello 350 m a.s.l.
004–R. Mercure, Rotonda 326 m a.s.l.
005–R. Noce, Maratea 30 m a.s.l.
006–T. Fiumara Atella, Toppo dell’Elce 700 m a.s.l.
007–Fiumara di Tito springs 600 m a.s.l.
008–L. Sirino springs, Nemoli 780 m a.s.l.
009–Brook in Vignale-Rivello 600 m a.s.l.
010–Brook, Fiumara d’Isca, Baragiano 500 m a.s.l.
011–Brook Picerno-Ruoti 700 m a.s.l.
012–Brook, Piano del Greco, Tito 600 m a.s.l.
013–R. Sinni springs, Mount Sirino 800 m a.s.l.
014–T. Camastra, Laurenzana 580 m a.s.l.

Calabria

- 001–Torrent Fiumara di Bonamico, Madonna dei Polsi 860 m a.s.l.
002–Torrent Fiumara di Novito, Agnana Calabria 159 m a.s.l.
003–Brook Passovecchio, Crotone 9 m a.s.l.
004–R. Vitravo, Casabona 1000 m a.s.l.
005–Spring, Civita 450 m a.s.l.
006–Hygropetric Fiumara Bonamico, S. Luca 250 m a.s.l.
007–Spring in S. Agata d’Esaro 500 m a.s.l.
008–T. Arancio, S. Maria del Patire 310 m a.s.l.
009–T. Colognati, Rossano 400 m a.s.l.
010–T. Coserie, Cropalati 299 m a.s.l.
011–T. Manche, Buonvicino 650 m a.s.l.
012–T. Ortiano, Longobucco 330 m a.s.l.
013–T. Raganello, Gole di Civita 400 m a.s.l.
014–T. Raganello, Francavilla Marittima 90 m a.s.l.
015–T. Topanello, Rocca di Neto 27 m a.s.l.
016–R. Tacina, Roccabernarda 78 m a.s.l.

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TABLE 1. (Continued)**Sicilia**

- 001–Torrent south of Castelbuono 423 m a.s.l.
002–R. Alcantara, Calatabiano 30 m a.s.l.
003–R. Alcantara, Giardini di Naxos 20 m a.s.l.
004–R. Batticano, Torrazza, Corleone 270 m a.s.l.
005–R. Belice, Fratina 550 m a.s.l.
006–R. Belice, Castelvetrano 20 m a.s.l.
007–R. Caldo, Alcamo 20 m a.s.l.
008–R. Cutò, Compaga-Cesarò 800 m a.s.l.
009–R. di Naso, Brolo 5 m a.s.l.
010–R. Dittaino, SS 121, Leonforte 300 m a.s.l.
011–R. Irmínio, Ragusa 300 m a.s.l.
012–R. Manghisi, SS 287, Canicattini-Bagni 400 m a.s.l.
013–R. Oreto, Case di Lino, Monreale 97 m a.s.l.
014–R. Oreto, S. Caterina, Monreale 50 m a.s.l.
015–R. Oreto, Caculla 27 m a.s.l.
016–Fiumara di Caronia 50 m a.s.l.
017–R. Simeto 750 m a.s.l.
018–R. Simeto 700 m a.s.l.
019–R. Simeto, Ponte della Cantera, Bronte 570 m a.s.l.
020–R. Simeto, Ponte la Barca, Paternò 60 m a.s.l.
021–R. Simeto, Catania 20 m a.s.l.
022–R. Vacco, Contrada Intera, Fiumedinisi 350 m a.s.l.
023–R. Verdura, Cozzo Tragaleggi, Calamonaci 95 m a.s.l.
024–Hygropetric, Floresta 700 m a.s.l.
025–Francavilla di Sicilia 300 m a.s.l.
026–T. Cava Grande, Pantalica-Sortino 200 m a.s.l.
027–Valle del Caffaro, Paternò 170 m a.s.l.
028–T. S.Elia, Contrada Caculla, Monreale 400 m a.s.l.
029–Spring, Mount Le Fosse, Grottamura 300 m a.s.l.
030–T. Isnello, Isnello 600 m a.s.l.
031–T. Rugirotto, Malvagna 775 m a.s.l.
032–T. S. Cataldo, Palombaro-Motta 450 m a.s.l.
033–T. Tellarita, Case Archera, Tripi 450 m a.s.l.
034–T. Tellaro, Rosolini 90 m a.s.l.
035–T. Cava Grande, Mulino del Papa, Noto 360 m a.s.l.
036–Torrent Portella Colla 1300 m a.s.l.

Sardegna

- 001–Bruncu Istiddi, Gennergentu 998 m a.s.l.
002–Spring in Cantoniera Genna, Gugina-Baunei 700 m a.s.l.
003–Brook Rio Mannu, Domus de Maria 66 m a.s.l.

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TABLE 1. (Continued)

004–R. Cossigana, Luras Cunzados 350 m a.s.l.
005–R. Cuba, Capitana-Villasimius 2 m a.s.l.
006–Fosso Ferracciolo, Caprera 50-20 m a.s.l.
007–Fosso Stagnali, Caprera 50-0 m a.s.l.
008–Fosso di Stefano, Caprera 30 m a.s.l.
009–Fosso Vena Lunga, Isola Maddalena 50-15 m a.s.l.
010–Fosso Zanioli, Isola Maddalena 50-20 m a.s.l.
011–Fontanamela-Carcidano 700 m a.s.l.
012–Hygropetric, Orani 620 m a.s.l.
013–L. Bidighinzu inlet 334 m a.s.l.
014–Meana Sardo 588 m a.s.l.
015–Brook Rio Araxisi, Atzara-Meana 325 m a.s.l.
016–Brook Rio Calambru, Bonorva-Bona 500 m a.s.l.
017–Brook Rio S. Giovanni 46 m a.s.l.
018–Brook Rio Cedrino 300 m a.s.l.
019–Brook Rio Chileiu, S. Antonio di Gallura 166 m a.s.l.
020–Brook Rio Lu Riareddu, Gallura 1 m a.s.l.
021–Brook Rio dei Monti, Gutturu Sporta-Teulada 50 m a.s.l.
022–Brook Rio dell’Impitratu, Salone 0 m a.s.l.
023–Brook in Golfo Cugnaga, Cantoniera Aglientina 300 m a.s.l.
024–Brook in Alzoni, Nialiccia-Arzachena 62 m a.s.l.
025–Brook in Alzoni, Azzacultedda-Arzachena 50 m a.s.l.
026–Brook Rio di Lu Piantoni, Lu Rotu, Ciapparottu 8 m a.s.l.
027–Rio di Montilogu springs 210 m a.s.l.
028–Brook Rio di Montilogu, La Murantina 26 m a.s.l.
029–Tributary of brook in Petralonga, l’Nialiccia 68 m a.s.l.
030–Tributary of brook in Petralonga, la Punga 15 m a.s.l.
031–Brook Rio Giamone, Mount Limbara 400 m a.s.l.
032–Brook Rio Isalle, L.Pozzillo dam 745 m a.s.l.
033–Brook Rio Isalle 300 m a.s.l.
034–Falls in brook Rio Malliu 397 m a.s.l.
035–Brook Rio Malliu, Muravera 60 m a.s.l.
036–Brook Rio Mannu, Allai 60 m a.s.l.
037–Brook Rio S. Elena, SS 389, Ittia 460 m a.s.l.
038 –Brook Rio Sa Picocca, Muravera 10 m a.s.l.
039–Brook Rio S. Teodoro, strada Olbia-Nuoro 58 m a.s.l.
040–Brook Cantoniera Campu Omu 380 m a.s.l.
041–Brook Cantoniera Santu Perdu 60 m a.s.l.
042–Brook, Rio S. Teodoro, Olbia 10 m a.s.l.
043–Spring S. Giuseppe, strada Siniscola-Nuoro 50 m a.s.l.
044–Spring Su Cologone, S. Giovanni 90 m a.s.l.
045–Spring in Castiadas-Muravera 60 m a.s.l.

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TABLE 1. (Continued)

046–T. La Cagghinosa, Mount Limbara 540 m a.s.l.
 047–Spring in Pineta di Monti, Badde Suelzu 450 m a.s.l.
 048–Spring brook, Cantoniera Giustizieri 750 m a.s.l.
 049–Ussassai 610 m a.s.l.

Elba

001–Fosso Ordicole 130 m a.s.l.

Capraia

001–Hygropetric, Vado del Porto 450 m a.s.l.

002–Brook 4 m a.s.l.

The most widespread species are *H. vectis* (18 regions, with 131 sites mainly located in Sicilia and Sardegna) and *H. angulata* (16 regions, with 135 sites mainly located in Umbria). *Hydroptila cortensis*, *H. fiorii* and *H. serrata* were found only in Sardegna. *Hydroptila tacheti* was present only in Friuli-Venezia Giulia.

Ecological parameters

Ecological parameters are not available for all the *Hydroptila* collection sites here examined. *Hydroptila* collection sites range from sea level (Marche, site 23 in Table 1) to 1900 m a.s.l. (Abruzzo, site 2 in Table 1). The average altitude of most *Hydroptila* collection sites are between 200 and 400 m a.s.l. The exceptions are Abruzzo (average 1100 m a.s.l.) and Basilicata (average 500 m a.s.l.) (Fig. 3). *Hydroptila vectis* was found at both minimum and maximum altitudes. In contrast, the average altitude of Trichoptera collection sites is above 400 m, with lower values for Puglia (200 m a.s.l.) and Marche (300 m a.s.l.) and high values in Valle d’Aosta (1700 m a.s.l.), and both Trentino Alto Adige and Piemonte (1200 m a.s.l.) (Fig. 4).

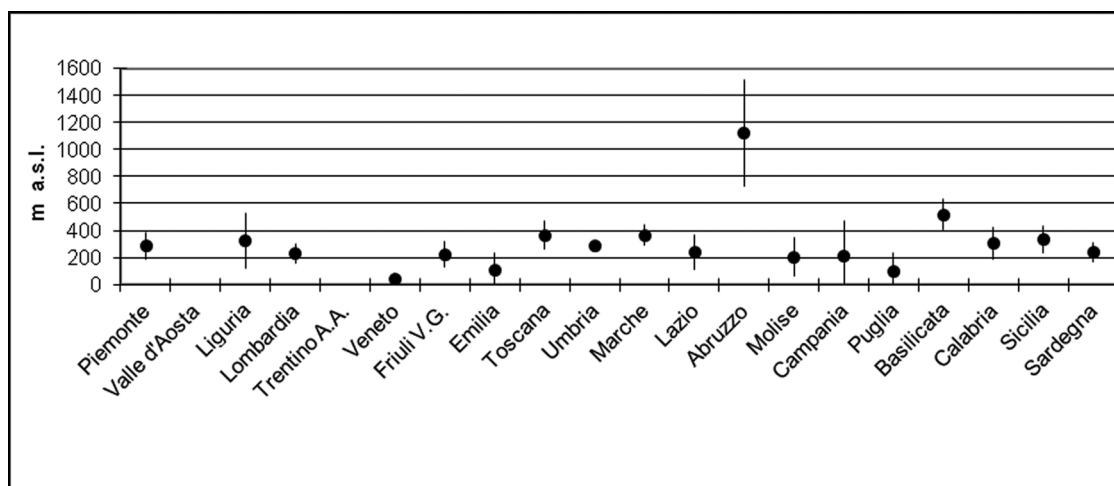


FIGURE 3. Mean altitude of *Hydroptila* collection sites in each region, with 95% confidence intervals.

As stated before, most *Hydroptila* species were found between 200 and 400 m a.s.l. *Hydroptila ruffoi*, *H. insubrica* and *H. stellifera* were found at higher altitudes (450–550 m a.s.l.) and *H. angustata* at lower altitudes (100 m a.s.l.) (Fig. 5).

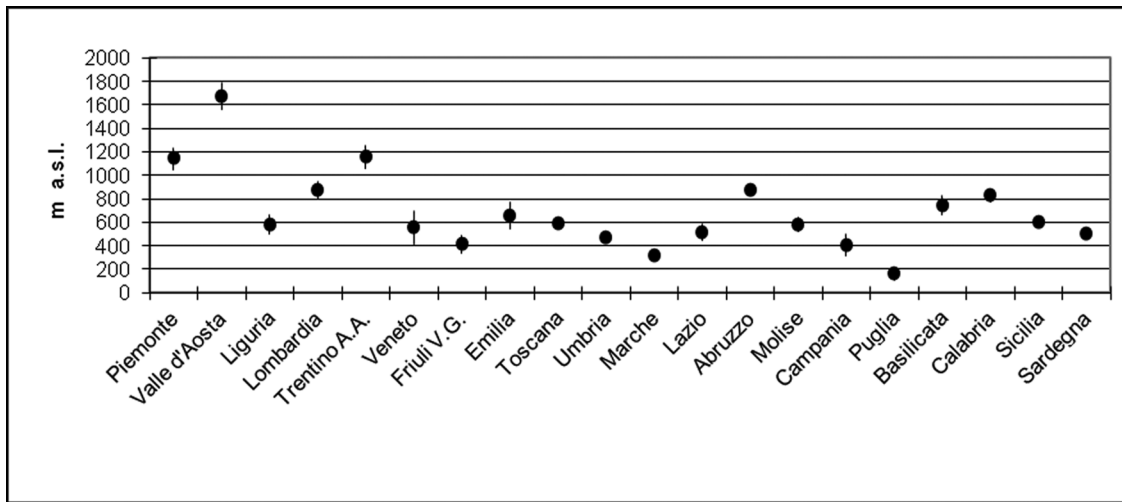


FIGURE 4. Mean altitude of Trichoptera collection sites in each region, with 95% confidence intervals.

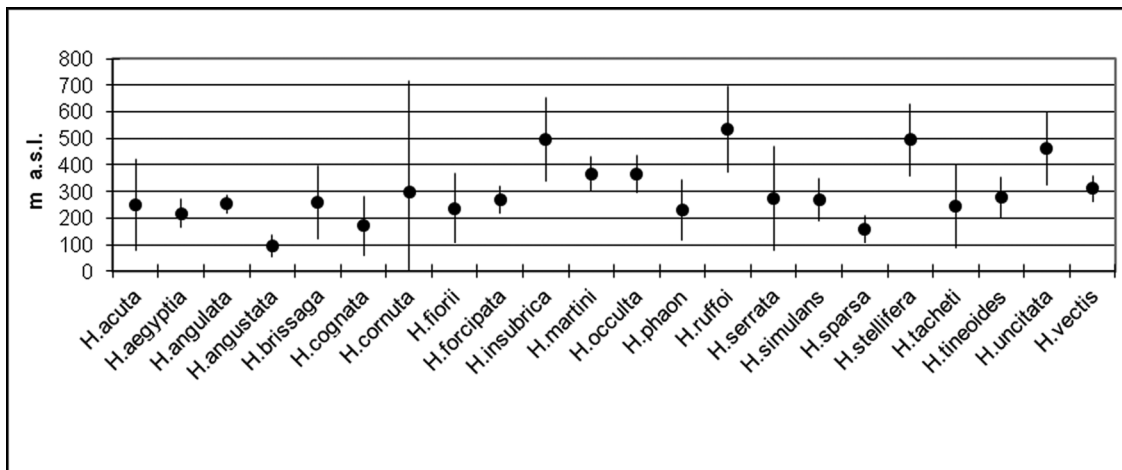


FIGURE 5. Mean altitude of the collection sites of 22 *Hydroptila* species (95% confidence intervals).

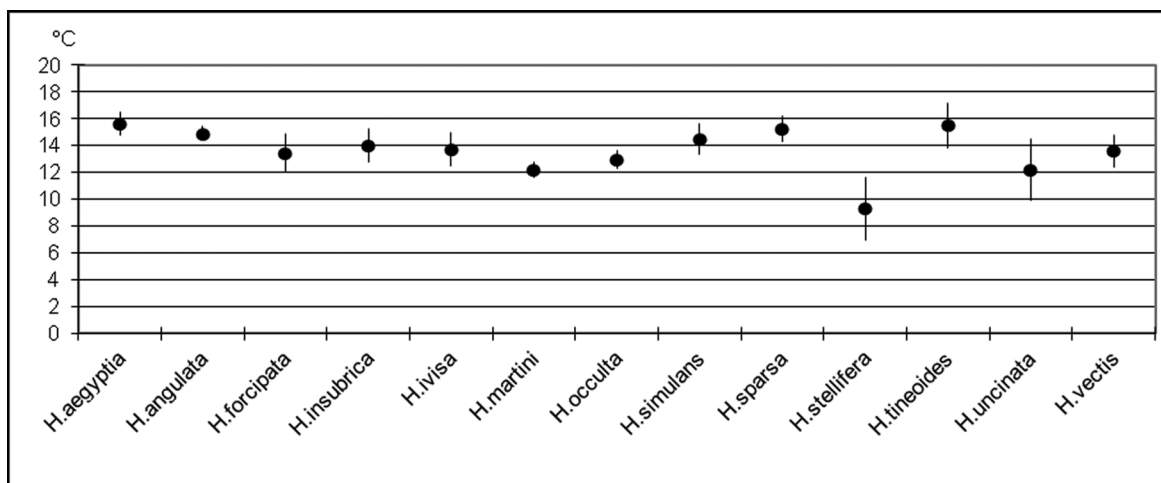


FIGURE 6. Mean water temperature (°C) of the collection sites of 13 *Hydroptila* species, 95% confidence intervals.

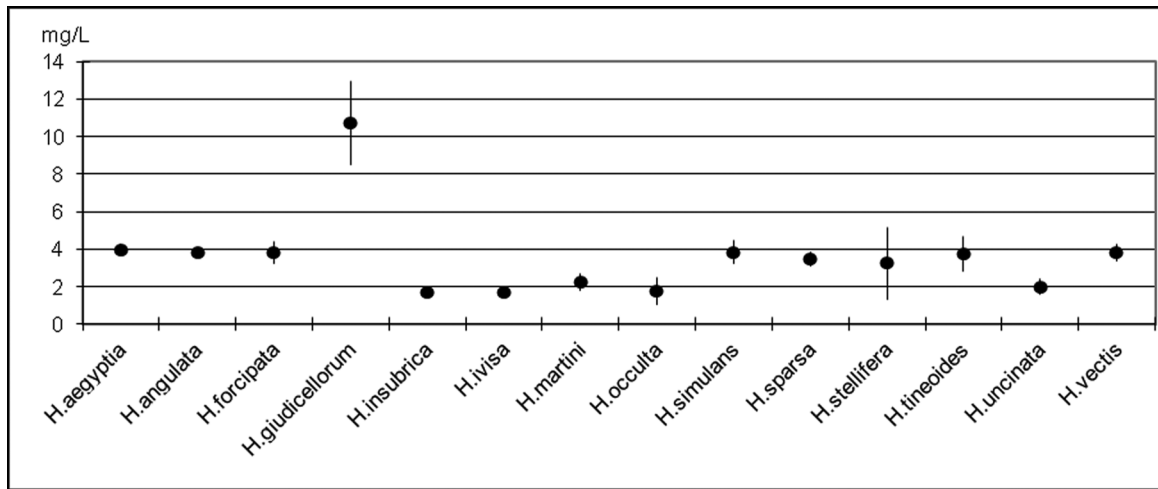


FIGURE 7. Mean organic matter (mg/L) of the collection sites of 14 *Hydropsyche* species, with 95% confidence intervals.

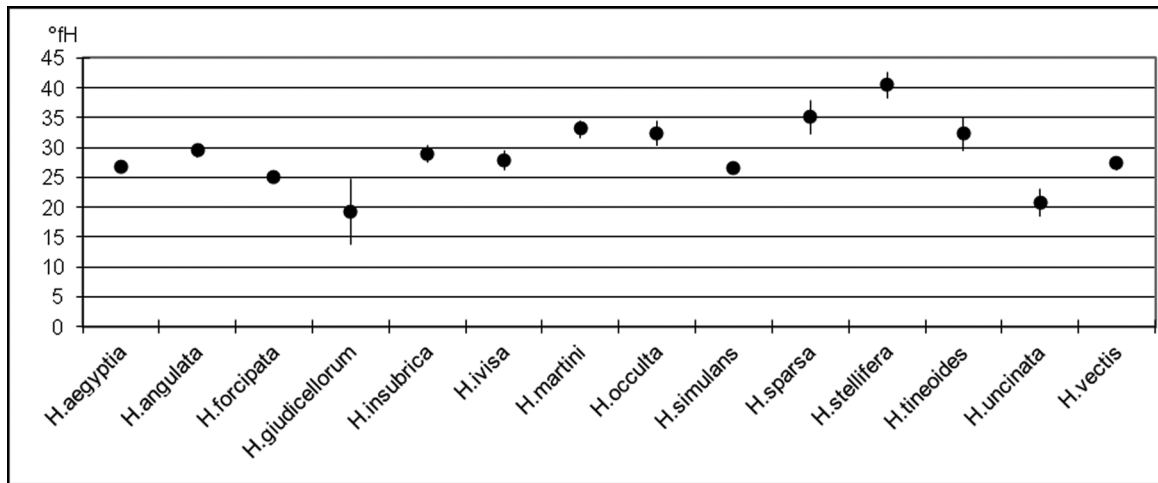


FIGURE 8. Mean total hardness (°fH) of the collection sites of 14 *Hydropsyche* species, with 95% confidence intervals.

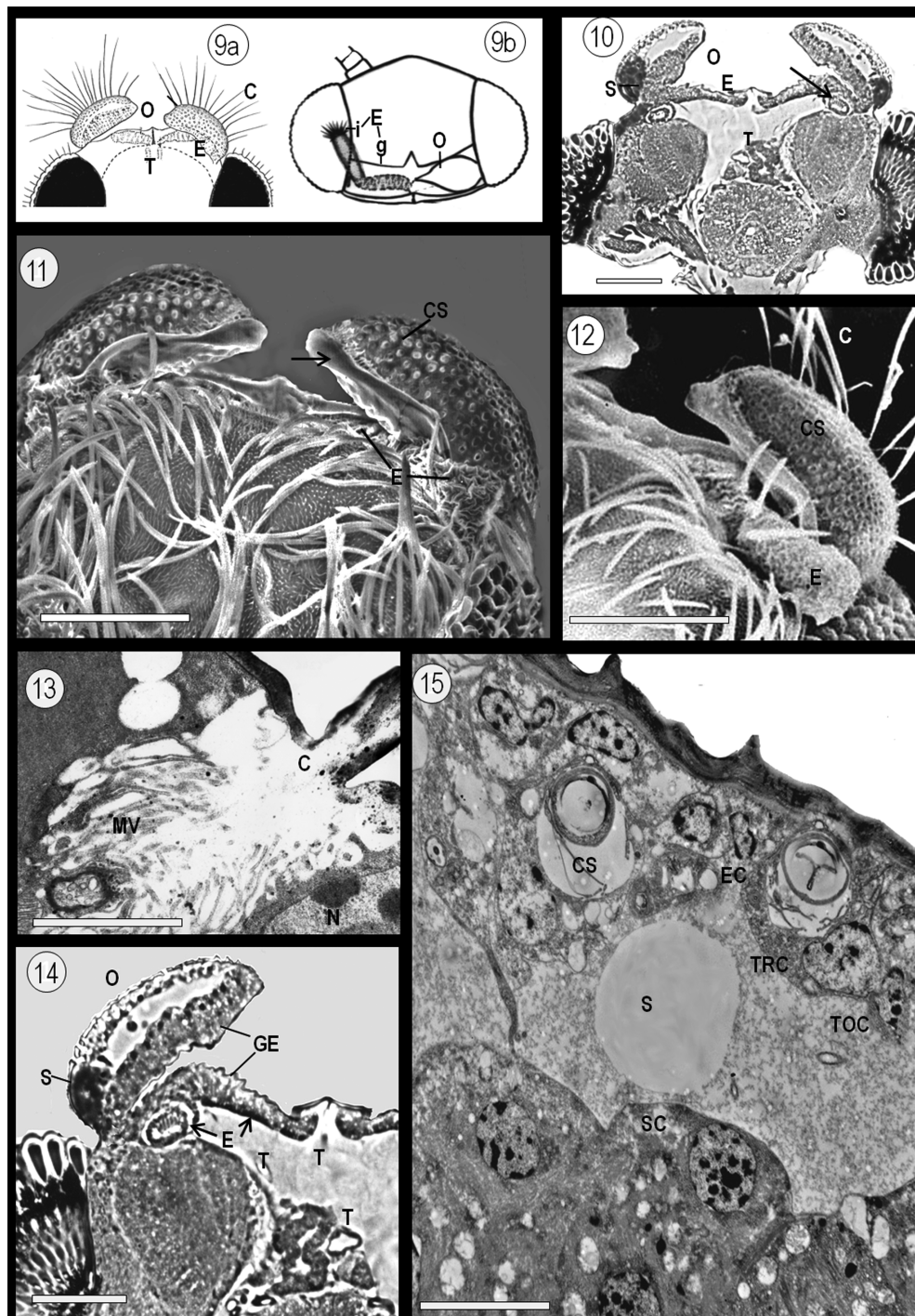
The main water physico-chemical parameters were recorded for several species. The highest average water temperature (16°C) was recorded for *H. aegyptia* and *H. tineoides* and the lowest (10°C) for *H. stellifera* (Fig. 6). Most species live in waters at oxygen levels close to saturation and pH close to neutrality (pH 7–8). Organic matter values range between 2 and 4 mg/L except for *H. giudicellorum* found in biotopes with an organic matter content of 10 mg/L (Fig. 7). Total hardness values range between 20 to 40 French degrees (°fH) with the exception of *H. giudicellorum* that tolerates values below 20°fH (Fig. 8). Higher H₂S and NO₃⁻ values are found in waters inhabited by *H. vectis* (H₂S = 4 mg/L; NO₃⁻ = 6 mg/L) and *H. aegyptia* (H₂S = 5 mg/L; NO₃⁻ = 5 mg/L).

Cephalic scent glands in male Hydropsyche aegyptia

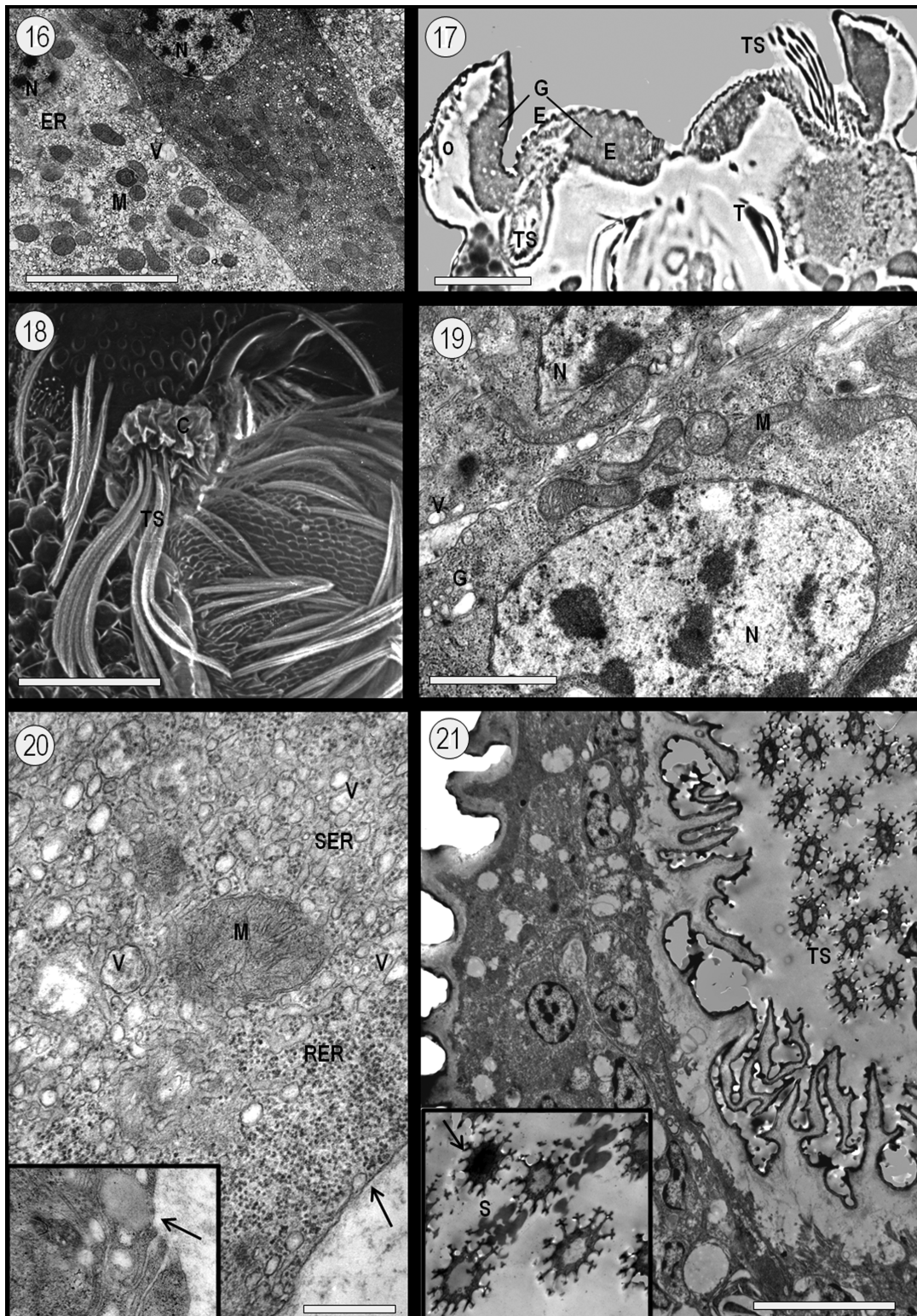
A complex structure is found on the heads of male *Hydropsyche aegyptia* at the sexually active stage. It is made of a pair of lateral, moveable sclerites, which we call “opercula,” located above the occipital arch, and an eversible organ which, when inactive, lies underneath each operculum (Figs 9a, 9b, 10).

The opercula are each about 150–170 μm long and each has a convex outer surface, strongly sclerotized, and a smooth inner surface (Fig. 11). The opercula are inserted just above the eyes and are attached on their posterior margins, allowing them to be raised anteriorly to allow the protrusion of the eversible organs (Fig. 12). The thick cuticle of the opercular outer surface is evenly covered by chetae inserted in round, raised sockets (Figs 11,12, 13). Histological and ultrastructural examinations of an operculum show trichogen and tormogen cells underneath the chetae sockets together with smaller cells forming the epidermal layer; this layer is separated by a fluid-filled space from a glandular epithelium made of columnar cells lying on the

operculum inner cuticle (Figs 13, 14, 15). In some specimens, adjacent columnar cells have different electron-density, which may indicate a diverse secretory cycle (Fig. 16).



FIGURES 9–15. Male *Hydroptila aegyptia* Ulmer 1963 scent organ. **9**, **9a**, schematic drawing of the scent organ complex. O = opercula; E = eversible organs; T = trachea; **9b**, schematic drawing showing medial glandular portion (g) and the protruded distal inflatable portion (i) of the eversible organ (E). O = operculum. **10**, cross section of the male head showing the secretion (S) in the opercula (O) and the underlying eversible organ (E) with the retracted distal portion (arrow); T = trachea; phase contrast microscope; bar = 100 μ m. **11**, opercula with chetae sockets (CS) on the sclerotized outer surface (chaete removed) and a smooth cuticle lining the inner surface (arrow); E = eversible organ; SEM; bar = 100 μ m. **12**, operculum covered by long chaete (C) inserted in round, raised sockets (CS); the operculum is partially opened and the eversible organ (E) is extruded; SEM; bar = 100 μ m. **13**, insertion point of a chaeta; C = chaeta, MV = trichogen cell microvilli, N = trichogen cell nucleus; TEM; bar = 10 μ m. **14**, scent organ cross section—Note the secretion (S) in the operculum (O) space towards the eversible organ (E); GE = glandular epithelium, T = trachea; phase contrast microscope; bar = 100 μ m. **15**, operculum cross section; CS = chetae sockets, EC = epidermal cell, S = secretion, SC = secretory cell, TOC = tormogen cell, TRC = trichogen cell; TEM; bar = 5 μ m.



FIGURES 16–21. Male *Hydroptila aegyptia* Ulmer 1963 scent organ. **16**, columnar secretory cells with different electron-density; ER = endoplasmic reticulum, M = mitochondria, N = nucleus, V = vesicles; TEM; bar = 5 μ m. **17**, scent organ cross section showing glandular epithelium (GE) in both the basal portion of the operculum (O) and the medial portion of the eversible organ (E)—Note the distal portion of the eversible organ partially protruded on one side with the fanned tuft of setae (TS); phase contrast microscope; bar = 100 μ m. **18**, distal portion of the eversible organ; C = cuticle, TS = tuft of setae; SEM; bar = 50 μ m. **19**, secretory cell; M = mitochondria, G = Golgi complex, N = nucleus, V = secretion vesicle; TEM; bar = 1 μ m. **20**, secretory cell cytoplasm; M = mitochondria, RER = rough endoplasmic reticulum, SER = smooth endoplasmic reticulum, V = secretion vesicle; inset: Secretory cell—Note the exocytosis of the secretion vesicle (arrow); TEM; bar = 0.5 μ m. **21**, eversible organ; TS = tuft of setae; inset: Secretion (S) inside and around the setae—Note the secretion filling the seta lumen (arrow); TEM; bar = 5 μ m.

The eversible organs, located at the bases of the opercula, are made of a *medial glandular portion* underneath the occipital arch and a *distal inflatable portion* that protrudes when the opercula open up (Figs 9b, 12). There is continuity of glandular epithelium from the medial portion of the eversible organ to the basal part of the operculum (Fig. 17). The distal portion of an eversible organ is lined by a thin, corrugated cuticle (Fig. 12) and has a tuft of long setae at the tip (Fig. 18). At rest, this inflatable portion is invaginated and the thin cuticle is pleated around the tuft of setae, surrounded by the secretory portion (Figs 10, 14). When inflated, the distal portion allows the tuft of setae to extend (Figs 17, 18). Tracheoles underneath the eversible organs were observed (Figs 10, 14, 17).

The glandular epithelium in both the operculum and the medial portion of the eversible organ shows characteristic secretory activity. The secretory cells have an elliptical nucleus with dense chromatin clumps (Fig. 19). The cytoplasm has abundant polymorphous mitochondria, Golgi complexes and great development of both rough and smooth endoplasmic reticulum; extensive formation of secretion vesicles is seen in the cytoplasm (Figs 19, 20).

In the operculum, secretion vesicles are extruded in the central space that connects with the eversible organ (Fig. 20 and inset). Large secretion vesicles, often coalescent, were observed filling the operculum space in many specimens (Figs 10, 14). In the medial portion of the eversible organ, secretion vesicles are extruded in the space extending into the distal inflatable portion at the base of the tuft of setae. The setae are longitudinally grooved with complex ribs extending from the central cuticular ring surrounding a wide lumen (Fig. 21). Secretion is found in the lumen and around the setae (inset of Fig. 21), thus indicating that it is dispersed when the eversible organ is inflated and the brush of setae fans out.

Catalogue of the Hydroptila species found in Italy

The *Hydroptila* species found in Italy are listed according to the order of the Checklist of Italian Trichoptera (Cianficconi 2006) updated on the basis of revisions by Malicky (2004). For each species, the collection sites are recorded together with the corresponding number on Table 1, the date, the number of adults and aquatic stages (l=larva, p=pupa, pr=prepupa, epc= empty pupal case), the name of the collector and references when available. (L) indicates the specimens collected with light traps.

1. *Hydroptila acuta* Mosely 1930

Piemonte: 13–Malicky 2002. **Liguria:** 2–Malicky 2002. 3–Malicky 2002. 4–Malicky 2002. 5–Malicky 2002. 6–21/07/79: 28m#, Valle 2001. 8–Malicky 2002. 9–25/06/2001: 1m#, 2f#, Malicky (*in litt.*). **Toscana:** 3–14/08/97: 6m#, Valle 2001. 4–27/08/96: 6m#, Valle 2001.

2. *Hydroptila aegyptia* Ulmer 1963

Lombardia: 24–16/05/1969: 1m#, Moretti. **Veneto:** 1–28/05/1987: 1m#, Di Giovanni et al. 2004. **Friuli Venezia Giulia:** 10–Cianficconi et al. 1999. **Toscana:** 13–00/00/96: 1m#, Moretti. 17–05/07/1979: 49m#, Di Giovanni et al. 2004. 18–17/06/1970: 2m#, Di Giovanni et al. 2004. **Umbria:** 16–13/06/1966: 6m#, Rossi. 41–27/09/1982: 9m#; 06/10/1982: 20m#, 5f#; 02/06/1983: 2m#; 09/06/1983: 33m#; 23/06/1983: 5m#, Selvi. 43–22/07/1977: 23m#, 2f#, Pirisinu. 46–20/07/1975: 1m#, Tucciarelli. 47–12/05/1966: 1m#, Viganò. 50–12/07/1967: 1m#, Gammaitoni. 55–15/07/1976: 19m#, 23f#, Viganò. 59–15/07/1966: 8m#, 2f#, Viganò; 06/08/1968: 29m#, 16f#; 21/09/1970: 4pm#, 2 l, Moretti. 80–06/08/1952: 3m#, 1f#; 25/02/1953: 4f#, 4 fpv, Moretti. 81–02/08/1968: 1m#, Portarena. 84–24/07/1981: 2m#, Moretti. 85–04/08/1975: 46m#; 13/06/1976: 10m#; 19/06/1976: 1m#; 15/07/1976: 1f#, 5 l; 30/07/1976: 80m#, Moretti. 86–04/08/1975: 30m#; 13/06/1976: 15m#; 30/07/1976: 85m#; 23/09/1976: 10m#, Moretti. 87–04/08/1975: 19m#; 13/06/1976: 5m#; 30/07/1976: 20m#; 23/09/1976: 14m#, Moretti. 88–1/09/1972: 2m#; 30/07/1979: 2m#, Moretti. 89–01/07/1974: 1m#, Moretti; 07/10/1976: 1m#, Moretti. 90–15/07/1976: 3m#, 2 p, 1 l. 91–07/10/1976: 1m#. 92–27/11/1976: 10 l, Moretti, Cianficconi, Tucciarelli. 93–06/09/1970: 8m#, 1f#, Di Giovanni et al. 2004. 94–05/07/1985: 12m#; 18/09/85: 78m#, 4f#; 19/09/1985: 1f#; 02/12/1985: 25m#; 30/07/1986: 10 m#; 07/09/1986: 13m#, 1f#; 19/08/1991: 11m#, 2f#, Di Giovanni et al. 2004. 95–06/09/1970: 8m#, 1f#, 11 l, Moretti & coll. 96–15/06/1952: 1m#; 16/06/1952: 102m#, 1f#, 97pm#, 82 l, Moretti & coll.; 16/07/1952: 7m#, 1f#, 4 l, Antognelli; 09/08/1954: 1 p; 18/05/1955: 86m#; 28/05/1955: 1m#; 28/10/1955: 32 epc; 29/03/1976: 63 p; 11/05/1972: 20 p; 29/03/1976: 32 l; 08/05/1976: 76 p; 14/05/1977: 113 p, 18 l, Moretti et al. 1978b. 97–16/07/1952: 34 pr, Lazzerini. 98–16/07/69: 37m#; 26/05/83: 65m#; 04/11/1983: 2m#; 19/10/84: 25m#; 23/10/1984: 1055m#, 25f#; 25/01/1985: 2m#; 01/05/1985: 6m#; 05/07/1985: 12m#; 19/07/1985: 6 l; 23/07/1985: 21m#(L); 12/08/

1985: 67m#(L); 02/10/1986: 289m#; 04/06/1987: 1m#; 17/06/1989: 1m#(L); 01/07/1989: 404m#; 16/07/1989: 38m#; 08/08/1989: 94m#, 9f#; 21/08/1989: 58m#(L); 15/08/1991: 18m#, 2f#; 16/08/1991: 12m#, 8f#; 17/08/1991: 16m#; 18/08/1991: 33m#, 6f#; 21/06/1992: larvae; 01/07/1992: 1m#, 1f#; 30/06/1993: 9m#; 01/07/1993: 1m#, Di Giovanni *et al.* 2004. **99**–04/06/1985: 78m#, 4f#; 11/08/1985: 67m#; 02/06/1986: 1m#; 4/06/1987: 1m#; 14/06/1987: 1m#, Chiappafreddo. **100**–11/06/1967: 144m#, 43f#; 18/06/1967: 9m#; 19f#, Di Giovanni *et al.* 2004; 09/07/1967: 41 m#, 36f#, Moretti; 20/08/1967 24m#, 5f#; 24/08/1968: 4m#, 2f#, Di Giovanni *et al.* 2004. **101**–11/09/1976: 2 l, 05/07/1985: 35m#, Cianficconi, Corallini, Chiappafreddo; 13/06/1991: 1m#, Cruccolini. **102**–17/07/1990: 2m#, 3 l, Chiappafreddo. **103**–26/07/1991: 1m#; 22/10/1991: 1 l, Iorio. **119**–19/07/91: 1m#, Moretti. **Lazio**: **4**–02/08/1969: 1m#, Di Giovanni *et al.* 2004. **11**–05/08/1968: 22m#, Moretti & coll. **12**–29/07/1968: 70m#, Moretti, Pirisinu. **13**–26/04/1968: 169m#; 02/05/1968: 1m#; 13/05/1968: 2m#; 29/06/1968: 30m#; 14/05/1969: 45m#, Di Giovanni *et al.* 2004. **14**–01/11/70: 3m#, 1f#, Di Giovanni *et al.* 2004. **15**–18/11/1970: 18m#, 1f#; 18/11/1970: 15m#, Di Giovanni *et al.* 2004. **16**–13/06/1966: 6m#, Di Giovanni *et al.* 2004. **17**–18/10/1991: 1m#, 1f#, Berdini. **18**–24/05/1972: 407m#, 56f#, Moretti. 24/05/1979: 2f#; 08/06/1979: 21m#; 28/7/79: 379m#, 52f#; 28/08/1979: 1m#; 15/07/1982: 5m#, 1f#, Di Giovanni *et al.* 2004. **19**–22/02/1975: 2 pm#, 80 l; 21/03/1975: 1pf#, 1 pr, 43 l; 26/04/1975: 17 l; 30/04/1975: 1m#; 30/05/1975: 1m#; 20/06/1975: 2m#; 24/07/1975: 1pf#, 16 l; 28/08/1975: 226m#, 2f#, 7 l; 1/10/75: 331m#, 1f#, Tucciarelli. **Puglia**: **6**–02/04/1994: 1m#, 1pm#, 1pf#, 29 l; 29/04/94: 1m#; 25/08/1994: 11m#, 1f#, 3pm#, 1pf#, 1 l; 16/09/1994: 2m#; 21/11/1994: 4m#, 3f#; 05/01/1995: 1pm#; 04/03/1995: 4m#, 1f#; 02/04/1995: 1m#, 1pf#; 02/05/1995: 3m#; 21/05/1995: 1pm#, 2 l, Annese. **Sicilia**: **21**–21/05/1995: 21m#, Valle 2001. **34**–20/05/1995: 1m#, Valle 2001.

3. *Hydroptila angulata* Mosely 1922

Piemonte: **1**–06/89/1980: 2m#, Piottoli; Bertuetti *et al.* 2001. **2**–28/09/1980: 13m#, 4f#, Piottoli; Bertuetti *et al.* 2001. **3**–Bertuetti *et al.* 2001. **5**–Bertuetti *et al.* 2001. **7**–Bertuetti *et al.* 2001. **8**–Bertuetti *et al.* 2001. **13**–23/06/2001: 1m# Malicky (*in litteris*). **15**–06/09/1980: 2m#, Di Giovanni *et al.* 2004. **17**–28/09/1980: 13m#, 4f#, Di Giovanni *et al.* 2004. **Liguria**: **5**–24/09/2000: 1m# Malicky 2004. **Lombardia**: **1**–18/06-05/07-13/09/1996: 15m#, 11f#, Bertuetti & Valle 2003. **2**–18/05-05/07-02/08/1996: 90m#(L), 89f#(L), Bertuetti & Valle 2003. **3**–05/07-02/08/1996: 11m#(L), 50f#(L), Bertuetti & Valle 2003. **8**–Bertuetti *et al.* 2001. **9**–Bertuetti *et al.* 2001. **10**–Bertuetti *et al.* 2001. **11**–Bertuetti *et al.* 2001. **12**–Bertuetti *et al.* 2001. **Veneto**: **2**–Bertuetti *et al.* 2001. **Friuli Venezia Giulia**: **9**–13/06/2001: 1m#, Morandini. **Emilia Romagna**: in Coll.Zangheri. **1**–22/07/1992: 143m#, 42f#; 01/09/1992: 3m#, Cianficconi *et al.* 1993. **2**–Bertuetti *et al.* 2001. **4**–Bertuetti *et al.* 2001. **5**–Bertuetti *et al.* 2001. **6**–Bertuetti *et al.* 2001. **7**–23/07/1992: 60m#, 10f#, Cianficconi *et al.* 1993. **Toscana**: **6**–20/06/1970: 4m#, 4f#, Moretti; 00/06/1970: 2m#, 3f#, Moretti *et al.* 1970. **8**–05/07/1985: 5m#, 12f#, Di Giovanni *et al.* 2004. **9**–01/08/1970: 1m#, 3f#; 09/09/1970: 2m#, 3f#; 24/09/1970: 22m#, 86f# Moretti *et al.* 1970. **10**–24/06/1992: 2m#, 1f#, Di Giovanni *et al.* 2004. **11**–26/09/1969: 1m#, Di Giovanni *et al.* 2004; 19/05/1980: 1m#, Cianficconi, Moretti, Marinelli. **12**–22/07/1967: 3m#, 3f#, Di Giovanni *et al.* 2004. **13**–27/08/1968: 18m#, 33f#, Boriosi. **14**–27/08/1968: 16m#, 36f#; 07/10/1968: 40m#, 216f#; 09/07/1969: 1m#; 14/07/1969: 2m#; 07/10/1969: 7m#; 22/07/1970: 1m#; 27/07/1970: 12m#, 12f#, Boriosi; 27/07/1983: 10m#, 178f#, 25/09/1983: 1m#, 5f#, Selvi; 07/08/1968: 16m#, 36f#; 07/10/1968: 8m#; 27/07/1970: 12f#; 27/07/1983: 10m#, 178f#; 25/09/1983: 1m#, 5f#, Di Giovanni *et al.* 2004. **15**–25/08/1982: 171m#, 234f#; 09/09/1982: 5m#, 9f#, Di Giovanni *et al.* 2004. **20**–26/09/1970: 2m#, 1f#, Moretti *et al.* 1970. **22**–26/09/1970: 1f#, Di Giovanni *et al.* 2004. **26**–24/06/1992: 2m#, 1f#, Chiappafreddo. **27**–24/09/1970: 2m#, 1f#; 31/07/1970: 1m#, 1f#, Di Giovanni *et al.* 2004; **Umbria**: **1**–06/08/1952: 5m#, 6f#, Moretti; 05/06/1956: 4f#, Morrioni; 17/08/1984: 36m#, 65f#, Salerno. **2**–06/09/1998: 2f#(L). **3**–03/08/1994: 6f#(L), Cianficconi *et al.* 2000a. **4**–06/09/1998: 2f#(L), Cianficconi, Mazzerioli. **5**–11/08/1993: 63m#, 210f#(L), 11pm#, Cianficconi *et al.* 1999a. **6**–11/08/1993: 3f#(L); 08/07/1996: 1m#(L); 17/07/1996: 1m#, 10f#, 1m#(L), 2f#(L); 08/08/1996: 1m#(L), Cianficconi *et al.* 1999b. **12**–06/12/1963-14/02/64-08/05/1964: 1m#, 15f#, Moretti. **17**–25/09/1969: 1m#, Di Giovanni *et al.* 2004. **19**–00/00/1975: 1m#, Moretti & coll. **20**–00/01/1972: larvae, Moretti *et al.* 1978. **21**–00/00/1972: 12m#, 18f#, Mearelli; 28/04/1977: 8m#, 2f#, Di Giovanni *et al.* 2004. **22**–28/04/1977: 8m#, 2f#, Di Giovanni *et al.* 2004; 04/07/1997: 1m#, 1f# (L); 01/09/1997: 1m#, 4f#; 31/08/1998: 1m#, 2f#, 17/09/1998: 1m#, 9f# (L), Cianficconi *et al.* 2000b; **23**–00/00/1972: 2m#, 6f#; 00/08/1972: 3m#, 10f#, 1 l, Mearelli, Truffini; 04/07/1997: 1m#(L), 1f# (L); 05/08/1997: 49m#, 72f#; 13/07/1997: 29m# (L), 55f#(L); 31/08/1998: 1m#, 1f#; 17/09/1998: 9m#(L), 8f#(L), Todini, Salerno. **24**–00/07/1972: 1, Moretti *et al.* 1978; 07/07/1997: 1m#(L), 1f#(L); 01/09/1997: 1m#(L), 8f#(L); 31/08/1998: 1m#(L), 2f#(L);

27/07/1999: 1f#(L), Todini, Salerno. **25**–00/00/1972: 11m#, 18f#, Mearelli, Truffini; 27/07/1997: 9m#(L), 11f#(L); 21/09/1997: 3m#(L), 271f#(L); 17/09/1998: 2m#, 3f#, Di Giovanni *et al.* 2004. **26**–00/06/1972: 1m#, 2f#, 3 l, Mearelli, Truffini; 03/08/1997: 3m#(L), 19f#(L); 21/09/1997: 2m#(L), 265f#(L); 07/09/1998: 180m#(L); 218f#(L), Todini, Salerno. **27**–12/08/1997: 1m#, 2f#, Di Giovanni *et al.* 2004. **28**–12/08/1997: 7m#, 9f#, Todini. **29**–30/10/70: 8 pm#, 24 pf#, 172 p, Alessandri; 01/09/1975: 2 l, Moretti; 15/08/1997: 2m#, 10f#, Todini; 19/10/1982: 4m#; 09/06/1983: 59m#, 210f#; 02/10/1983: 52m#, 196f#; 05/07/1985: 44m#, 202f#, Chiappafreddo. **31**–19/10/1982: 4m#; 02/10/83: 52m#, 199f#; 19/10/83: 63f#; 05/07/85: 44m#, 202f#; 09/07/1985: 13m#, 31f#, Di Giovanni *et al.* 2004. **32**–Moretti *et al.* 1988. **33**–06/09/83: 12m#, 1f#; 28/09/1983: 5m#, 9f#, Di Giovanni *et al.* 2004. **34**–28/09/1983: 23m#, 9f#; 28/09/1984: 4m#, 3f#, Di Giovanni *et al.* 2004. **35**–09/06/1983: 1m#, Di Giovanni *et al.* 2004. **36**–02/07/1975: 12m#, 111f#; 19/10/1982: 4m#; 09/06/1983: 59m#, 210f#; 29/09/1983: 1m#, 1f#; 02/10/1983: 52m#, 196f#, Chiappafreddo. **41**–01/08/1970: 1m#, 8f#; 09/08/1970: 2m#, 7f#, Marri; 27/09/1982: 38m#, 106f#; 06/10/1982: 20m#, 5f#; 02/06/1983: 2m#; 09/06/1983: 33f#; 23/06/1983: 5m#, 68f#, Selvi. **42**–24/09/1970: 33m#, 38f#, Di Giovanni *et al.* 2004. **43**–21/06/1968: 35m#, 36f#; 24/09/1970: 33m#, 38f#; 22/07/1977: 23m#, 2f#, Di Giovanni *et al.* 2004. **44**–22/07/1967: 3m#, Pirisinu. **45**–12/05/1966: 4m#, 2pm#, 1pf#, Di Giovanni *et al.* 2004. **46**–04/07/1975: 1m#, 3f#; 08/09/1975: 1f#; 07/10/1975: 3m#, 3f#, Cianficconi, Tucciarelli. **47**–12/05/1966: 1m#, Di Giovanni *et al.* 2004. **48**–12/05/1966: 1m#, 2f#; 01/12/1966: 1m#, 1f#, Viganò. **49**–03/06/1964: 1m#; 22/08/1965: 25m#, 12f#; 20/04/1966: 13 m#; 04/05/1966: 1m#; 11/05/1966: 2m#; 15/05/1966: 1m#; 16/05/1966: 1m#; 19/05/1966: 1m#, 2f#; 09/06/1966: 1m#, 1f#; 22/06/10966: 1f#; 10/07/1966: 7m#; 13/07/1966: 2m#; 25/05/1967: 5m#, 2f#; 21/07/1967: 77m#, 39f#; 182 p; 22/07/1967: 44m#, 30f#; 24/05/1968: 5m#, 6f#; 25/05/1968: 3m#, 2f#, Taticchi. **50**–11/05/1966: p; 01/06/66: 4f#; 12/07/1976: 1m#, larvae; 07/1967: 15m#, 4f#, Buscella. **52**–21/09/1970: 4pm#, 52 p, 4 l, 80 epc; 29/07/1971: 16m#, 26f#; 30/10/1980: 8 epc, Alessandri. **53**–19/05/1970: 4 l; 20/08/1970: 8pf#, 56 l, Marri; 21/09/1970: 4pm#, 8pf#, 48 l; 30/6/71: 8pm#; 29/07/1971: 20m#, 48f#, Alessandri. **54**–01/07/1970: 1m#, 3f#; 20/08/1971: 27m#, 42f#, Tabarrini. **56**–15/07/1976: 19m#, 25f#, Di Giovanni *et al.* 2004. **57**–06/08/1968: 2m#, Norcia; 21/09/1970: 32m#, 20f#, 124 p, 36 l, 208 epc, Cardellini. **58**–06/08/1968: 31m#, 16f#, Norcia. **59**–15/07/1966: 8m#, 2f#; 06/08/1968: 37m#, 18f#, 5pm#; 21/09/1970: 4pm#, 1pf#, Di Giovanni *et al.* 2004. **60**–24/09/1971: 8pm#, 52 epc, Cardellini. **61**–24/05/1968: 2m#, 8f#, Di Giovanni *et al.* 2004. **62**–21/04/1967: 2 l, Pirisinu, Giovagnoni. 21/07/1967: 12m#, 15f#, Giovagnoni; 22/07/1967: 5m#, 73 l; 03/08/1967: 9m#, Giovagnoni, Ridolfi. 24/05/1968: 1m#, 7f#, Pirisinu, Valeri; 14/06/1970: 7m#, 10f#; 04/07/1971: 29pm#, Pirisinu; 13/10/71: 1m#, 1f#, Viganò; 8 p, Pirisinu. **63**–12/09/1968: 2pm#, 2 l; 05/1969: 2f#; 09/07/1969: 1m#; 14/07/1969: 2m#, 3m#; 14/06/1970: 5 p; 04/07/1971: 3 p; 14/12/1970: 1epc; 02/07/1975: 8m#, 2f#, Moretti. **64**–21/04/1967: 3f#, Di Giovanni *et al.* 2004. **65**–02/07/1975: 7m#, 17f#, Moretti. **66**–13/10/1971: 1m#, 1f#, Cardellini. **67**–09/07/1975: 7m#, 13f#, Moretti. & coll.. **68**–09/07/1975: 1m#, Moretti & coll. **70**–07/09/1994: 24m#, 19f#(L), Salerno; 23/08/1995: 2f#, Montanucci. **71**–10/08/1995: 2f#, Montanucci. **72** –23/08/1995: 3f#, Montanucci. **75**–00/00/1993: 1m#, Cianficconi *et al.* 1994 **76**–17/07/1996: 1f# (L), Cianficconi *et al.* 1999b. **77**–06/08/1952: 5m#, 6f#; 25/02/1953: 4 l; 25/11/1953: larvae; 05/06/1956: 4f#, Moretti; 18/09/1993: 310f#; 19/09/1993: 15m#, 224f# (L), Romano. **79**–12/07/1969: 1m#, 1f#, Raicone; 29/08/1970: 5m#, 37f#, Di Giovanni *et al.* 2004. **80**–06/08/1952: 4f#, Di Giovanni *et al.* 2004: 5/06/1956 4f#, Morroni; 06/06/1956: 2f#; 18/09/1993: 310f#; 19/09/1993: 15m#, 6f#, Di Giovanni *et al.* 2004. **81**–02/08/1968: 1m#, Moretti; 02/08/1968: 1m#, 1f#, Portarena. **83**–24/07/1981: 2m#, 12f#, Cianficconi *et al.* 1994. **84**–24/07/1981: 2m#; 18/09/1981: 2m#, 43f#, Di Giovanni *et al.* 2004; 18/09/81: 2m#, 43f#, Cianficconi *et al.* 1994. **93**–00/00/1971: 1m#, Moretti. **94**–05/07/1985: 71m#, 4f#, Chiappafreddo. 30/07/1986: 1m#, Di Giovanni *et al.* 2004. **95**–02/07/1975: 8m#, 2f#, Moretti. **108**–24/08/1998: 2f#, Meniconi. **109**–09/06/1983: 10f#, Peroni. **110**–Moretti *et al.* 1988. **114**–21/07/1994: 3m#, 8f#, Di Giovanni *et al.* 2004. **115**–17/08/1993: 1m# (L), Salerno. **116**–18/10/1998: 1f#, Fabbri. **118**–05/07/1994: 5m#, 9f#(L), Cianficconi *et al.* 1999 b. **119**–25/08/1993: 75m#, 162f#(L); 23/09/1993: 1m#, 18f#(L); 05/10/1993: 21 f#(L), Cianficconi *et al.* 1999 a. **120**–11/04/1996: 2m#, 2f#, Giovannini. **122**–22/08/1993: 1m#, 392f# (L), Salerno. **Marche**: **1**–17/08/1984: 36m#, 65f#, Cianficconi *et al.* 2007. **3**–16/08/1993: 1m# (L); 29/06/1994: 1f#, Cianficconi *et al.* 2007. **4**–25/08/1994: 18m#, 114f#, Cianficconi *et al.* 2007. **5**–29/08/1994: 2f#, Cianficconi *et al.* 2007. **6**–09/09/1997: 1m#, 10f#, Cianficconi *et al.* 2007. **7**–01/08/1994: 64m#, 178f#, Cianficconi *et al.* 2007. **8**–09/09/1994: 1m#, 1f#, Cianficconi *et al.* 2007. **9**–08/08/1994: 3m#, Cianficconi *et al.* 2007. **10**–23/08/1994: 62m#, 1f#, Cianficconi *et al.* 2007. **16**–05/07/1984: 12 l, Cianficconi *et al.* 2007. **19**–00/00/1965: 1m#, Cianficconi *et al.* 2007. **21**–00/00/1965: 1pm#, Cianficconi *et al.* 2007. **23**–00/00/1965: 1pm#, 1 l, Cianficconi *et al.* 2007. **24**–24/07/1978: 24m#, 17f#, Moretti. **28**–09/09/1994: 1m#, 13f#, Cianficconi *et al.* 2007. **Lazio**: **1**–00/00/

1992: 1pm#; 07/09/1993: 3 l, Fochetti *et al.* 1994. **2**–00/00/1980: 1pm#, 1 l, Carchini *et al.* 1988. **3**–06/09/1983: 2m#, 2f#; 29/09/1983: 18m#, 18f#, Di Giovanni *et al.* 2004; 04/07/1985: 1f#; 09/07/1985: 13m#, 31f#, Ronca. **4**–02/08/1968: 4m#, Di Giovanni *et al.* 2004. **6**–24/05/1968: 1f#, Di Giovanni *et al.* 2004. **7**–15/07/1966: 1m#, Di Giovanni *et al.* 2004. **8**–23/07/1966: 1m#, Moretti. **10**–13/06/1970: 5m#, 6f#, Moretti. **18**–08/06/1979: 11m#, 4f#; 28/07/1979: 7m#, Moretti, Cianficconi, Tucciarelli. **18**–08/06/1979: 4m#, 4f#,. Di Giovanni *et al.* 2004. **Abruzzo**: **3**–08/08/1994: 3m#, Osella. **4**–20/07/1953: 6m#, 14f#, Testa. 20/08/1953: 1; 17/08/1959: 1m#, 4f#, Di Giovanni *et al.* 2004. **Puglia**: **8**–13/04/1979: 3pm#, 1pf#, 2 pr, larvae, Di Giovanni *et al.* 2004. **Basilicata**: **1**–22/05/1984: 1f#, Cianficconi *et al.* 1986; 23/05/1984: 1m#, Di Giovanni *et al.* 2004. **14**–31/10/83: 4m#, 1f#, Cianficconi *et al.* 1986. **Calabria**: **3**–02/10/1973: 1m#, 3f#, Cianficconi *et al.* 1986. **16**–06/03/1973: 1f#, 1pm#, 1 pr, larvae, Scalise. **Sicilia**: **6**–16/09/1978: 4m#, 1f#, Cianficconi *et al.* 1999a. **7**–22/02/1989: 7m#, 5f#, Cianficconi *et al.* 1999a. **18**–24/11/1985: 10m#, 1f#, Di Giovanni *et al.* 2004. **19**–19/11/1985: 11m#, 2f#; 24/11/1985: 10m#, 1f#, Cianficconi *et al.* 1999a. **20**–11/09/1978: 39m#, 9f#, Cianficconi *et al.* 1999a. **Sardegna**: **14**–Moretti & Cianficconi 1983. **16**–31/05/1964: 3m#, Moretti & Cianficconi 1983. **33**–19/05/1980: 1m#, Moretti & Cianficconi 1983. **36**–Moretti & Cianficconi 1983. **38**–03/06/1964: 1m#, Moretti & Cianficconi 1983. **39**–19/05/1980: 1m#, Moretti & Cianficconi 1983. **42**–19/05/1980: 1m# Pirisinu.

4. *Hydroptila angustata* Mosely 1939

Piemonte: **2**–02/09/1997: 1f#; 01/10/1997: 1f#; 17/07/1998: 2m#, Bertuetti *et al.* 2001. **3**–01/09/1997: 2m#; 02/10/1997: 1f#; 20/07/1998: 1m#, 7f#, Bertuetti *et al.* 2001. **5**–20/07/1998: 4f#, Bertuetti *et al.* 2001. **7**–04/06/1997: 3f#; 20/07/1998: 4f#, Bertuetti *et al.* 2001. **8**–04/06/1997: 4m#, 21f#; 01/09/1997: 1m#, 4f#; 20/07/1998: 4f#, Bertuetti *et al.* 2001. **Lombardia**: **7**–04/06/1997: 26m#, 3f#; 1/09/1997: 1f#; 20/07/1998: 86m#, 55f#, Bertuetti *et al.* 2001. **9**–03/09/1997: 1f#, Bertuetti *et al.* 2001. **10**–04/06/1997: 2m#; 20/05/1998: 2f#; 22/07/1998: 1m#, 2f#, Bertuetti *et al.* 2001. **Emilia Romagna**: **2**–01/09/1997: 1f#, Bertuetti *et al.* 2001. **5**–22/07/1998: 3f#, Bertuetti *et al.* 2001.

5. *Hydroptila brissaga* Malicky 1996

Piemonte: **13**–23/06/2001: 46, Malicky 2004; 13/08/2002: 1m#, Malicky 2004. **Friuli Venezia Giulia**: **2**–10/08/2000: 13m#, 10f#, coll. Malicky. **5**–08/06/2012: 4m#, Malicky (*in litt.*) **7**–5/07/2002: 3m#, 2f#, Malicky (*in litt.*). **8**–00/00/1885: 1m#, Desio. **Sicilia**: **25**–14/05/1981: 1m#; 21/05/1981: 1m#; 13/05/1982: 1m#; 13/06/1982: 1m#; Cianficconi *et al.* 1999a.

6. *Hydroptila cognata* Mosely 1930

Lombardia: **22**–26/08/1999: 3m#, Malicky 2002. **23**–04/10/1989: 1m#, Heiss, Malicky (*in litt.*). **Veneto**: **3**–00/00/79: 1m#, coll. Malicky. **Friuli Venezia Giulia**: Cianficconi *et al.* 1999. **Toscana**: **3**–19/06/1997: 22m#; 14/08/1997: 8m#, Valle 2001. **4**–27/08/1996: 1m#, 1f#, Valle 2001. **Molise**: **2**–31/08/2000: 2m#, (L), Cianficconi *et al.* 2010.

7. *Hydroptila cornuta* Mosely 1922

Piemonte: **7**–03/10/1980: 1m#, 1f#, Piottoli. **12**–11/08/1980: 1m#, Di Giovanni *et al.* 2004. **Toscana**: **5**–09/08/1957: 1m#, Di Giovanni *et al.* 2004. **Lazio**: **4**–02/08/1968: 2m#, Moretti.

8. *Hydroptila cortensis* Mosely 1937

Sardegna: **49**–Coll. Malicky.

9. *Hydroptila fiorii* Malicky & Moretti 1987

Sardegna: **3**–24/05/1981: 1m#, Malicky *et al.* 1987. **15**–02/06/1964: 1m#, Di Giovanni *et al.* 2004. **18**–19/05/1980: 1m#, Di Giovanni *et al.* 2004. **31**–13/05/1986: 1m#, Di Giovanni *et al.* 2004. **44**–21/05/1980: 6m#, 5f#, Di Giovanni *et al.* 2004. **47**–Cianficconi *et al.* 1996

10. *Hydroptila forcipata* (Eaton 1873)

Piemonte: **2**–Bertuetti *et al.* 2001. **4**–Bertuetti *et al.* 2001. **7**–Bertuetti *et al.* 2001. **8**–Bertuetti *et al.* 2001. **11**–00/00/1884: 1m#, Ghiliani (*in* McLachlan 1874–80). **13**–13/08/2002: 2m#, 1f#, Malicky (*in litteris*). **Liguria**: **4**–25/09/2000: 4m#, 3f#, Malicky 2004. **Lombardia**: **1**–20/06/1935: 1m#; 00/00/1937: 1m#,

Moretti; 18/6-05/08/1996: 5m#, 18f#, Bertuetti & Valle 2003. **2**-18/05-05/07-02/08/1996: 115m#, 27f#, Bertuetti & Valle 2003. **3**-02/08/1996: 17m#(L), 23f#(L), Bertuetti & Valle 2003. **5**-23/06/1991: 1m#, 1f#, Cianficconi *et al.* 1993. **7**-Bertuetti *et al.* 2001. **8**-Bertuetti *et al.* 2001. **Fruli Venezia Giulia**: Cianficconi *et al.* 1999. **Emilia Romagna**: **7**-23/07/1992: 16m#, 2f#, Cianficconi *et al.* 1993. **Toscana**: fonte, Alpi Apuane: 09/09/1970: 4m#, Di Giovanni *et al.* 2004. **2**-31/07/1970: 4m#, 17f#, Di Giovanni *et al.* 2004; 20/09/1970: 4m#; 26/08/1970: 4m#, Moretti *et al.* 1970. **9**-24/09/1970: 3m#, 2f#, Moretti *et al.* 1970. **14**-26/07/1969: 1m#; 27/07/1969: 1m#, Boriosi; 27/07/1983: 2m#, Di Giovanni *et al.* 2004; 28/07/1983: 2m#; Selvi. **20**-31/7/70: 4m#, 17f#, Moretti *et al.* 1970; 1/8/70: 2m#, Moretti. **23**-29/06/1993: 2m#, 18f#, Cianficconi *et al.* 1993. **25**-26/09/1970: 2m#, 2f#, Moretti *et al.* 1970. **Umbria**: **3**-07/09/1993: 1m#(L), Salerno. **6**-17/07/1996 3m#(L), 19 f#(L); 08/08/1996: 1m#, 23f#, Di Giovanni *et al.* 2004. 19/10/1996: 6m#(L), 59f#(L), Cianficconi *et al.* 1999a. **7**-10/08/1993: 4m#, 1f# (L), Salerno. **30**-Moretti *et al.* 1988. **31**-19/10/82: 3m#, Di Giovanni *et al.* 2004. **32**-Moretti *et al.* 1988; 00/00/1985: 2m#, Moretti. **37**-06/05/1972: 5m#, 1f#, Di Giovanni *et al.* 2004. **43**-21/04/1967: 2m#, 2f#, Pirisinu; 22/07/1967: 2m#, 2f#; 25/07/1977: 1m#, Di Giovanni *et al.* 2004. **49**-08/07/1965: 3m#, 2f#; 08/06/1966: 1m#; 09/06/1966: 1m#; 21/06/1966: 1m#, larvae, Di Giovanni *et al.* 2004; 21/07/1967: 7m#, 4 p; 22/07/1967: 2m#, Taticchi. **76**-17/07/1996: 1f#(L), Cianficconi *et al.* 1999b. **115**-17/08/1993: 1m#(L), Salerno. **118**-08/08/1996: 19f#(L), Cianficconi *et al.* 1999b. **119**-25/08/1993: 87m#, 173f# (L), Di Giovanni *et al.* 2004; 19/10/1993: 1f#(L), Cianficconi *et al.* 1999b. **Marche**: **2**-16/08/1993: 2m#, 4f# (L); 10/09/1993: 1m#(L), Salerno. **3**-26/07/1993: 2f#; 29/06/1994: 16m#, 181f#, Cianficconi *et al.* 2007. **4**-26/08/1994: 1m#, 8f#, Cianficconi *et al.* 2007. **6**-09/09/1997: 2m#, 90f#, 5pm#, Cianficconi *et al.* 2007. **Lazio**: **3**-25/08/1982: 20m#, Ronca. **Campania**: **2**-16/08/1992: 1m#, Letardi (Corallini *et al.* in press).

11. *Hydroptila giudicellorum* Botosaneanu 1980

Sicilia: **12**-11/11/1986: 5m#, 1f#, Cianficconi *et al.* 1999a. **35**-27/07/1995: 1m#, Valle 2001. **Sardegna**: **30**-00/00/96: 1m#, Azara. **Capraia**: **2**-9/6/72: 1m#, Di Giovanni *et al.* 2004.

12. *Hydroptila insubrica* Ris 1903

Lombardia: **29**-08/05/1995: 1m#, Valle 2001. **Trentino Alto Adige**: Cianficconi 2002. **Umbria**: **1**-24/06/1976: 1m#, 3f#; 03/08/1977: 1m#, 2f#, Tucciarelli. **9**-20/10/1979: 2m#, Di Giovanni *et al.* 2004. **10**-30/07/1987: 10m#, 4f#, Chiappafreddo. **11**-22/07/1968: 8m#; 26/07/1968: 52m#, 8f#, Di Giovanni *et al.* 2004. **14**-29/07/1968: 5f#, Corrado. **18**-08/07/1969: 1m#, Di Giovanni *et al.* 2004; 08/07/1979: 1m#, Mearelli. **85**-03/06/1979: 2m#, Moretti. **88**-08/06/1979: 6m#, 2f#, Moretti. **113**-09/08/1995: 3m#, Fucchi. **Abruzzo**: **6**-25/07/1978: 1m#, Moretti. **Basilicata**: **13**-10/09/1972: 2m#, 2f#, Cianficconi *et al.* 1986.

13. *Hydroptila ivisa* Malicky 1972

Veneto: Cianficconi 2002. **Fruli Venezia Giulia**: **1**-30/05/1986: 1m#, Cianficconi *et al.* 1997.

14. *Hydroptila martini* Marshall 1977

Fruli Venezia Giulia: **6**-27/07/1994: 1m#, Di Giovanni *et al.* 2004. **Umbria**: **1**-29/11/1976: 5m#, 1pm#, 15 l, Dominici. **12**-08/05/1964: 14m#, 15f#, Gianotti; 18/09/1981: 14m#, 15f#, Moretti; 00/00/1995: 1m#, 1pm#, Corallini, Marchetti. **14**-00/00/1997: 1m#, 1pm#, Marchetti. **15**-13/04/197: 4m#, 2f#, Gianotti. **16**-25/09/1969: 1m#, Di Giovanni *et al.* 2004. **18**-24/09/1969: 1 l, Di Giovanni *et al.* 2004. **21**-22/07/1977: 1m#, Di Giovanni *et al.* 2004. **22**-22/07/1977: 2m#; 28/08/1997: 1m#(L), Todini, Truffini. **39**-10/04/1967: 1m#, Di Giovanni *et al.* 2004. **74**-03/06/1952: 169m#, 155f#, 31pm#; 05/08/1952: 13m#, 3f#, 31 pr; 20/09/1952: 35f#; 23/05/1953: 148m#, 106f#; 23/07/1953: 109f#; 24/07/1953: 3f#; 15/10/1953: 1m#, 2f#; 19/05/1955: 2m#; 30/04/1973: 4f#; 21/10/1973: 2m#, 4f#, Cianficconi; 01/06/1979: 4f#, Marini; 5m#, 1f#, Di Giovanni *et al.* 2004. **84**-18/09/1981: 1m#, Di Giovanni *et al.* 2004. **85**-13/06/1967: 3m#, 9f#, Di Giovanni *et al.* 2004; 00/00/1972: 3m#, 4f#, Moretti & coll. **89**-00/00/1972: 5m#, 2f#, 1pm#, Moretti & coll. **90**-00/00/1972: 1m#, Moretti & coll. **104**-06/12/1984: 1m#, Chiappafreddo. Cianficconi. **120**-04/07/1996: 1m#, Giovannini. **Marche**: **2**-16/08/1983: 7m#, 2f#(L.), Salerno. **3**-16/08/1993: 1m#; 26/06/1994: 1m#; 29/06/1994: 1m#, Cianficconi *et al.* 2007. **9**-08/08/1994: 34m#, Cianficconi *et al.* 2007. **12**-00/00/1985: 1m#, 1f#, Moretti & Cianficconi 1985. **13**-00/00/1985: 1m#, 1f#, Moretti 1985; 04/07/1984: 2m#, 1f#, Di Giovanni *et al.* 2004. **14**-04/07/1984: 2m#, 1f#, 4pm#, Cianficconi *et al.* 2007. **15**-00/00/1985: 1m#, 1f#, Cianficconi *et al.* 2007. **16**-00/00/1985: 1f#, Cianficconi *et al.* 2007. **17**-00/00/1985: 1m#, 1f#, Cianficconi *et al.* 2007. **31**-04/04/

1954: 21m#, Cianficconi *et al.* 2007. **Lazio:** 9–27/05/1991: 1m#; 17/10/1991: 1m#, Capoccia. 10–18/12/1970: 1m#, 1f#, Di Giovanni *et al.* 2004; 27/05/1991: 1m#, Capoccia. 17–30/04/1991: larvae; 07/05/1991: 16m#, 15f#; 10/05/1991: 1m#13/05/1991: 1m#, 3f#; 14/05/1991: 1m#, 3f#; 15/05/1991: 5m#, 3f#; 17/05/1991: 1m#, 1f#, 1pm#; 18/05/1991: 1m#, 1f#, 1pm#; 19/05/1991: 1m#, Berdini. 20–09/06/1981: 7m#, 4f#, Moretti & coll.; 15/07/1981: 2m#, 1f#, Di Giovanni *et al.* 2004. **Abruzzo:** 1–14/09/1960: 82m#, 79f#, Di Giovanni *et al.* 2004; 23/09/1963: 20m#, 12f#, Viganò. 3–08/08/1994: 3m#, Osella. **Molise:** 1–02/08/1975: 1m#, 1f#, Mastrogiuseppe. **Puglia:** 1–22/04/1980: 1m#, Di Giovanni *et al.* 2004. 3–29/04/1980: 3m#, Di Giovanni *et al.* 2004. 7–07/06/1991: 10m#, 11f#, 16 l, Di Giovanni *et al.* 2004. 10–04/06/1991: 1m#, Di Giovanni *et al.* 2004. **Basilicata:** 3–02/08/1993: 4m#, 15f#, Cianficconi *et al.* 1993. 4–02/08/1993: 5m#, 131f#, Cianficconi *et al.* 1993. 8–11/08/1976: 1m#, Cianficconi *et al.* 1986. 10–21/05/1984: 1m#, Cianficconi *et al.* 1986. **Calabria:** 14–30/07/1993: 1m#, Cianficconi *et al.* 1993. **Sicilia:** 29–19/02/1989: 1m#, Cianficconi *et al.* 1999a.

15. *Hydroptila occulta* (Eaton 1873)

Piemonte: 15–06/09/1980: 9m#, 3f#, Di Giovanni *et al.* 2004. **Umbria:** 1–09/07/1979: 1f#, 1 p, Tucciarelli. 12–18/08/1963: pupae, larvae; 06/12/1963: 1m#; 08/05/1964: 10m#, 15f#, Moretti & Gianotti 1966. 15–13/04/1967: 4m#, 2f#, 4 l, Moretti & Gianotti 1967. 70–10/08/1995: 2f#, Montanucci. 74–00/06/1952: 15m#, 48f#; 05/08/1952: 12m#, 8f#, Moretti 1952; 22/10/1973: 2m#, 4f#, Cianficconi. 112–09/08/1995: 1m#(L), Fucchi. **Marche:** 30–Cianficconi *et al.* 2007. 31–04/04/1954: m#m#,f#f#, Cianficconi *et al.* 2007. **Abruzzo:** 1–23/09/1963: 20m#, 12f#, Di Giovanni *et al.* 2004.

16. *Hydroptila phaon* Malicky 1976

Toscana: 4–19/06/1997: 4m#; 14/08/1997: 4m#, Valle 2001. 9–Moretti *et al.* 1988. 16–28/07/1983: 2m#, Selvi. **Umbria:** 35–09/07/1985: 1m#, Cianficconi, Chiappafreddo. **Marche:** 2–13/09/1993: 1m#(L), Salerno. **Basilicata:** 5–22/06/1998: 1m#, Valle 2001. **Calabria:** 10–20/08/1989: 1m#, Pignatari. 13–09/06/2003: 1m#, Malicky (*in litteris*). 15–30/07/1993: 8m#, 3f#, Valle 2001. **Sicilia:** 16–17/05/1995: 1m#, Valle 2001.

17. *Hydroptila ruffoi* Moretti 1981

Lombardia: 31–26/07/1995: 15f#; 07/07/1999: 1m#, 2f#; 20/07/1999: 11m#, 2f#, Valle 2001. **Toscana:** 21–01/07/1992: 2m#, Di Giovanni *et al.* 2004. 24–03/07/1985: 2m#, 1f# Di Giovanni *et al.* 2004. 26–28/04/1986: 7m#, 3f#, 33 l, Di Giovanni *et al.* 2004; 23/05/1986: 7m#, 1f#, Cianficconi *et al.* 2004; 12/09/1986: 1f#, Baviera. **Umbria:** 31–05/07/1985: 5m#, 5f#, Ronca. 78–19/05/1990: 6m#, 2f#, Romozzi. 105–23/06/1990: 1m#, Romozzi. **Abruzzo:** 6–25/07/1978: 1m#, Moretti 1981. **Basilicata:** 10–21/05/1984: 10m#, 4f#, Cianficconi *et al.* 1986; 02/06/1984: 10m#, 2f#, Chiappafreddo, Tucciarelli. 11–21/05/1984: 4m#, 1f#, Chiappafreddo, Tucciarelli.

18. *Hydroptila serrata* Morton 1898

Sardegna: 2–22/05/1980: 2m#, 1f#, Moretti & Cianficconi 1983. 6–22/01/1994: 5 l; 25/03/1994: 8m#, 10f#; 06/04/1994: 1m# 2f#; 19/05/1994: larvae, Cianficconi *et al.* 1996. 7–27/01/1994: larvae; 27/02/1994: larvae, Cianficconi *et al.* 1996. 8–23/01/1994: 8m#, 10f#, 5 l, Cianficconi *et al.* 1996. 9–26/02/1994: 6m#, 5f#; 05/04/1994: 2m#, 1f#; 15/04/94: 1f#, Cianficconi *et al.* 1996. 10–26/03/1994: 4m#, 3f#, Cianficconi *et al.* 1996. 12–02/06/1964: 2m#, Moretti & Cianficconi 1983. 21–Moretti & Cianficconi 1983. 37–15/05/1986: 1m#, Di Giovanni *et al.* 2004. 44–21/05/1994: 1m#, Di Giovanni *et al.* 2004. 48–22/05/1980: 3m#, 1f#; 23/05/1980: 1m#, Moretti.

19. *Hydroptila simulans* Mosely 1920

Piemonte: 19–15/08/1980: 4m#, Di Giovanni *et al.* 2004. **Liguria:** 6–21/07/1999: 5m#, Valle 2001. 7–31/07/1970: 1pm#, Ravizza. **Toscana:** 7–31/07/1970: 1pm# Moretti *et al.* 1970. 14–27/03/1983: 1m#, Di Giovanni *et al.* 2004; 28/07/1983: 2m#; 28/07/1983: 1m#, Selvi. 19–31/07/1970: 25m#, 14f#, 1 pr, 12 l, Di Giovanni *et al.* 2004. 20–01/08/1970: 1m#, 1f#, Moretti *et al.* 1970. 28–21/06/1972: 1m#, Di Giovanni *et al.* 2004. **Umbria:** 24–27/07/1999: 11m#, 12f#, Salerno. 25–07/09/1998: 19m#, 96f#, Cianficconi *et al.* 2000b. 33–28/09/1983: 1m#, Di Giovanni *et al.* 2004. 43–22/07/1967: 4m#, 2f#, Pirisinu. 44–21/07/1967: 4m#, 2f#, Moretti. 49–15/07/1965: 5m#, 2f#; 08/05/1966: 4m#; 11/05/1966: 1m#; 16/05/1966: 1m#; 19/05/1966: 1m#, f#f#, pupae, larvae; 09/06/1966: 5m#, 2f#; 21/06/1966: 1m#, 1f#; 27/06/1966: 3m#, 1f#; 09/07/1966: 24m#,

2f#; 13/07/1966: 3m#, 10f#, 1 l; 17/08/1966: 8m#, Di Giovanni 2004; 27/08/1966: 1m#, Taticchi; 25/05/1967: 1m#; 15/07/1967; 5m#, 2f#, Di Giovanni *et al.* 2004. **51**–22/07/1967: 2m#, Buscella. **111**–28/09/1983: 1m#, Chiappafreddo. **119**–25/08/1993: 1m# (L), Cianficconi 1999b. **122**–22/08/1993: 3m#(L), Salerno; 00/00/1998: 1m#, Meniconi. **Marche**: **3**–29/06/1994: 139m#, 1282f#, Cianficconi *et al.* 2007. **6**–09/09/1997: 25f#, Cianficconi *et al.* 2007. **29**–21/06/1972: 1m#, Cianficconi *et al.* 2007. **Lazio**: **4**–02/08/1968: 4m#, Di Giovanni *et al.* 2004. **Molise**: **2**–31/08/2000: 1m#(L), Cianficconi *et al.* 2010. **3**–01/09/2000: 1m#(L), Cianficconi *et al.* 2010. **Campania**: **1**–02/05/1982: 2m#, 3f#; 04/05/1982: 3m#, 3f#, Di Giovanni *et al.* 2004. **Basilicata**: **6**–23/05/1984: 1m#, 5f#, Di Giovanni *et al.* 2004. **Sicilia**: **11**–28/07/1995: 8m#, 16f#, Valle 2001. **35**–27/07/1995: 5m#, 13f#; 26/11/1995: 1m#, Valle 2001.

20. *Hydroptila sparsa* Curtis 1834

Piemonte: **2**–Bertuetti *et al.* 2001. **4**–Bertuetti *et al.* 2001. **5**–Bertuetti *et al.* 2001. **7**–3/10/80: 1m#, 1f#, Piottoli; Bertuetti *et al.* 2001. **8**–Bertuetti *et al.* 2001. **11**–00/00/1884: 1m#, 1f#, Ghiliani. **Lombardia**: **1**–19/10/1937: 1m#, Moretti; 05/07-02/08-13/09/1996: 5m#, 3f#, Bertuetti & Valle 2003. **2**–18/06-05/07/1996: 3m#(L), 10f#(L), Bertuetti & Valle 2003. **3**–02/08/1996: 6f# (L), Bertuetti *et al.* 2005. **6**–Bertuetti *et al.* 2005. **8**–Bertuetti *et al.* 2001. **9**–Bertuetti *et al.* 2001. **10**–Bertuetti *et al.* 2001. **11**–Bertuetti *et al.* 2001. **12**–Bertuetti *et al.* 2001. **13**–Bertuetti *et al.* 2005. **14**–Bertuetti *et al.* 2005. **16**–Bertuetti *et al.* 2005. **17**–Bertuetti *et al.* 2005. **26**–Bertuetti *et al.* 2005. **27**–Bertuetti *et al.* 2005. **28**–Bertuetti *et al.* 2005. **Friuli Venezia Giulia**: **10**–Cianficconi *et al.* 1999. **3**–14/09/1992: 20 l, Buda Damcevich. **4**–07/06/2012: 1m#, 8f#, Malicky (*in litteris*). **5**–08/06/2012: 17m#, 26f#, Malicky (*in litt.*). **Emilia Romagna**: **3**–Bertuetti *et al.* 2001. **4**–10/07/1975: 1m#, 2f#, Moretti *et al.* 1981a. **5**–Bertuetti *et al.* 2001. **6**–Bertuetti *et al.* 2001. **7**–Bertuetti *et al.* 2001. **Toscana**: **5**–08/09/1957: 1m#. Moretti. **Umbria**: **1**–24/05/1977: 1m#, Di Giovanni *et al.* 2004. **3**–03/08/1994: 6f#, Cianficconi *et al.* 2002. **7**–11/08/1993: 5f#, Moretti. **21**–28/04/1987: 1m#, Di Giovanni *et al.* 2004; 01/09/1977: 1m#(L), Salerno. **49**–17/08/1966: 1m#; 15/11/1966: 2m#, Di Giovanni *et al.* 2004. **77**–13/08/1952: m#m#, f#f#, Moretti 1952. **80**–13/08/1952: 2m#, 2f#, Moretti. **85**–24/05/1967: 4m#, Di Giovanni *et al.* 2004. **87**–23/8/2000: 1f#, Beco. **95**–13/08/1970: 6pm#, 1pf#, Taticchi. **119**–02/08/1995: 1f#, Moretti. **Lazio**: **5**–02/08/1968: 2m#, Di Giovanni *et al.* 2004. **19**–29/06/1976: 4m#, 3pm#, Di Giovanni *et al.* 2004. **Puglia**: **2**–13/11/1985: 4m#, 1f#; 30/11/1985: 4m#; 02/01/1986: 4m#, 3f#; 21/01/1986: 1f#; 01/04/1986: 1m#; 7/7/86: 104 pr; 26/02/1991: 22m#, 8f#, Di Giovanni *et al.* 2004. **4**–15/06/1975: 10m#, 3f#, Di Giovanni *et al.* 2004. **5**–19/04/1968: 1m#; 14/05/1960: 42m#, 209f#, 3pm#, 49 l, De Bartolomeo; 21/05/1968: 39 l; 09/06/1968: 38m#, 205f#; 25/09/1991: 3m#, 1f#, Di Giovanni *et al.* 2004. **8**–30/09/1978: 2m#; 14/04/1979: 97 l, Di Giovanni *et al.* 2004. **Calabria**: **4**–02/06/1979: larvae, Malena. **14**–30/07/1993: 1m#, Cianficconi *et al.* 1993. **Sicilia**: **6**–16/09/1978: 1m#, Cianficconi *et al.* 1999a.

21. *Hydroptila stellifera* Morton 1893

Piemonte: **13**–23/06/2001: 1m#, Malicky 2002. **Liguria**: **1**–26/06/2001: 4m#, Malicky 2002. **2**–26/06/2002: 38m#, 1f#, Malicky 2002. **Toscana**: **28**–08/08/1966: 2m#, Di Giovanni *et al.* 2004. **Umbria**: **106**–23/05/1985: 1m#; 21/04/1986: 1m#; 13/06/1986: 1f#, Di Giovanni *et al.* 2004. **107**–11/06/1985: 1m#; 13/05/1986: 1m#, Orecchini. **Basilicata**: **10**–21/05/1984: 4m#, 3f#, Di Giovanni *et al.* 2004. **11**–21/05/1984: 1m#, 1f#, Di Giovanni *et al.* 2004.

22. *Hydroptila tacheti* Coppa & Malicky 2005

Friuli Venezia Giulia: **2**–10/08/2000: 12m#, Coppa & Malicky 2005. **3**–03/09/1997: 11m#, Coppa & Malicky 2005. **4**–07/06/2012: 2m#, Malicky (*in litt.*) **5**–08/06/2012: 81 m#, Malicky (*in litt.*). **7**–05/07/2002: 3m#, Coppa & Malicky 2005.

23. *Hydroptila tigurina* Ris 1894

Lombardia: Cianficconi *et al.* 2002. **Molise**: **2**–31/08/2000: 5f#(L), Cianficconi *et al.* 2010. **Sicilia**: **34**–20/05/1995: 2f#, Valle 2001.

24. *Hydroptila tineoides* Dalman 1819

Piemonte: **13**–13/08/2002: 1m#, 4f#, Piottoli. **Lombardia**: **18**–Bertuetti *et al.* 2005. **19**–14/05-09/07/1997: 5m#(L), Bertuetti *et al.* 2005. **20**–00/08/1873: 1m#, 1f#, Eaton, McLachlan (1874–80). **21**–11/09/1979: 4m#, 1f#, Moretti. **24**–30/09/1936: 3m#; 17/05/1969: 81m#, 10f#, Di Giovanni *et al.* 2004. **25**–14/05-09/07-06/08/

1997: 9m#(L), 45f#(L), Bertuetti *et al.* 2005. **32**–10/09/1979: 1m#, Moretti. **33**–27/07/1995: 5m#(L), 1f#(L), Bertuetti *et al.* 2005. **Trentino Alto Adige**: Cianficconi *et al.* 2002. **Veneto**: **3**–17/05/1969: 70m#, 5f#, Moretti. **Umbria**: **12**–08/05/1964: 1m#, Di Giovanni *et al.* 2004. **21**–05/04/1977: 5m#, 49f#; 28/04/1977: 2m#, Truffini. **22**–07/07/1997: 1m#; 22/07/1977: 4m#; 27/07/1977: 1m#; 05/08/1997: 1m#; 31/08/1998: 1m#(L), 48f#(L), Di Giovanni *et al.* 2004. **23**–07/07/1997: 1m#(L); 05/08/1997: 1m#(L), Salerno. **36**–00/00/1985: 1m#, Peroni, Ronca. **63**–11/11/1974: 1 l, Moretti. **69**–08/05/1964: 1m#, Moretti. **73**–05/09/1987: 1f#, Di Giovanni *et al.* 2004. **86**–16/07/1976: 2m#, 1f#; 16/07/1976: 1m#, Moretti & coll. **123**–00/00/1998: 1m#, 2f#, Meniconi. **124**–00/00/1998: 7m#, 4f#, Meniconi. **Lazio**: **5**–09/07/1975: 1m#, Di Giovanni *et al.* 2004. **Campania**: **3**–01/10/1979: 1m#, Di Giovanni *et al.* 2004. **Puglia**: Cianficconi *et al.* 2002. **Basilicata**: **4**–02/08/1993: 1m#, Cianficconi *et al.* 1993. **Sardegna**: **5**–03/06/1964: 1m#, 2f#, Moretti & Cianficconi 1983. **32**–19/05/1980: 3m#, Moretti & Cianficconi 1983. **41**–03/06/1964: 1m#, 1f#, Moretti & Cianficconi 1983. **44**–21/05/1980: 1m#, Di Giovanni *et al.* 2004. **45**–03/06/1964: 1m#, Di Giovanni *et al.* 2004. **Capraia**: **1**–08/06/1972: 5m#, 4f#, Di Giovanni *et al.* 2004.

25. *Hydroptila uncinata* Morton 1893

Piemonte: **13**–23/06/2001: 7m#, Malicky 2004. **Toscana**: app.pistoiese 25/07/1882: 1m# Eaton, Malicky & Moretti 1987. **1**–24/09/1970: 1m#, Di Giovanni *et al.* 2004. **2**–09/09/1970: 3m#, Di Giovanni *et al.* 2004; 26/09/1970: 7m#, 1f#, Moretti 1970. **13**–15/06/1982: 7m#, Moretti; 25/06/1982: 5m#(L), 82f#, Di Giovanni *et al.* 2004. **21**–01/07/1992: 1m#, Chiappafreddo. **29**–31/05/1962: 1m#, Di Giovanni *et al.* 2004. **Umbria**: **8**–30/07/1978: 21m#, Di Giovanni *et al.* 2004. **37**–8/06/1983: 2m#; Capannelli, Chiappafreddo; **38**–26/06/1984: 3m#,.Cianficconi *et al.* 1994. **Marche**: **24**–24/06/1978: 1m#; 22/07/1978: 47m#, 19f# Cianficconi *et al.* 2007. 24/07/1978: 21m#, 17f#, Di Giovanni *et al.* 2004. **25**–20/10/1979: 1m#, Cianficconi *et al.* 2007. **30**–Cianficconi *et al.* 2007. **31**–14/04/1954: 1m#, 17 l, Cianficconi *et al.* 2007. **Abruzzo**: **5**–Cianficconi *et al.* 2002. **Puglia**: **9**–06/09/1986: 3m#, 2f#, Di Giovanni. **Calabria**: **2**–13/09/1983: 1m# Cianficconi 1986. **8**–09/07/1989: 9m#, 4f#; 21/08/1989: 1m#, Di Giovanni *et al.* 2004. **9**–08/09/1988: 5m#, 13f#; 1m#, Chiappafreddo; 20/03/1989: 2 l Moretti; 08/06/1989: 4m#, 7f#; 09/07/1989: 9m#, 2f#; **10**–09/07/1989: 1m#; 6f#, Di Giovanni *et al.* 2004. **Sicilia**: **1**–10/06/1982: 60 m#, Cianficconi *et al.* 1999a. **31**–14/11/1981: 30m#, Cianficconi *et al.* 1999a. **Sardegna**: **15**–02/06/1964: 1m#, Moretti & Cianficconi 1983.

26. *Hydroptila vectis* Curtis 1834

Piemonte: **2**–Bertuetti *et al.* 2001. **3**–Bertuetti *et al.* 2001. **5**–Bertuetti *et al.* 2001. **6**–Bertuetti *et al.* 2001. **7**–Bertuetti *et al.* 2001. **8**–Bertuetti *et al.* 2001. **9**–08/09/1990: 1m#, 1f#; 10/09/1990: 1m#, 1f#, Chiappafreddo. 18/09/1990: 1m#, 1f#, Malicky. **10**–02/07/1980: 3m#; 18/09/1990: 3m#, 3f#, Di Giovanni *et al.* 2004. **14**–22/09/1980: 1m#, Di Giovanni *et al.* 2004; 28/09/1980: 1m#, Piottoli. **16**–02/07/1980: 3m#; 19/7/80: 3m#, Piottoli. **18**–27/6/2004: 1f#, Malicky. (*in litt.*). **20**–10/9/90: 2m#, 2f#, Cianficconi, Chiappafreddo. **Liguria**: **1**–27/06/2001: 1f#, Malicky 2004. **5**–24/09/2000: 6f#; 25/06/2001: 6f#, Malicky 2004. **Lombardia**: **1**–18/06-05/07-02/08/1996: 8m#, 3f#, Bertuetti & Valle. 2003. **2**–18/06-05/07.02/08/1996: 14m#(L), 29f#(L), Bertuetti & Valle 2003. **3**– 02/08/1996: 14m#(L), 7f#(L), Bertuetti *et al.* 2005. **7**–Bertuetti *et al.* 2001. **8**–Bertuetti *et al.* 2001 . **9**–Bertuetti *et al.* 2001. **10**–Bertuetti *et al.* 2001. **11**–Bertuetti *et al.* 2001. **34**–31/07/2002: 1f#, Cianficconi *et al.* 2005. **Trentino Alto Adige**: **1**–19/09/2000: 1m#, Malicky 2005. **Veneto**: **2**–19/09/2000: 1m#, Bertuetti *et al.* 2001. **Friuli Venezia Giulia**: **10**–Cianficconi *et al.* 1999. **4**–07/06/2012: 200m#, 200f# Malicky (*in litt.*). **5**–08/06/2012: 3m#, 12f#, Malicky (*in litt.*). **Emilia Romagna**: **3**–Bertuetti *et al.* 2001. **6**–Bertuetti *et al.* 2001. **Toscana**: **9**–30/07/1957: m#m#; 20/08/1957: 3m#, 2f#; 24/08/1970: 3m#(L), 4f#(L), Di Giovanni *et al.* 2004; 09/09/1970: 1m#, Moretti 1970. **14**–27/07/1983: 1m#, Di Giovanni *et al.* 2004; 27/07/1983: 1m#, Selvi. **16**–21/08/1970: 1m#, Di Giovanni *et al.* 2004. **27**–24/09/1970: 3m#, Moretti *et al.* 1970. **Umbria**: **11**–29/07/1968: 2pm#, Corrado. **21**–25/07/1971: 6m#, 3f#, Moretti; 20/04/1977: 4m#, 1f#, Di Giovanni *et al.* 2004. **22**–05/04/1977: 1f#; 28/04/77: 2m#, 1f#, Moretti; 22/07/77: 1m#; 05/08/1997: 1m#(L); 31/08/1998: 1m#, 48f#, Salerno; 27/07/1999: 10f#(L), Cianficconi *et al.* 2000b. **23**–05/08/1997: 1m#(L), Salerno; 13/08/1998: 4m#, 10f#(L), Cianficconi *et al.* 2000b. **24**–07/07/1997: 1m#, Salerno; 28/04/1997: 28m#, 20f#, Cianficconi *et al.* 2000b. **25**–07/09/1998: 1m#, Todini. **31**–25/08/1982: 1m#, Peroni; 19/10/1982: 2m# Di Giovanni *et al.* 2004. **40**–16/03/1984: 16 m#, 13f#, Cianficconi, Corallini, Spinelli. **41**–23/06/1983: 1m#, Di Giovanni *et al.* 2004. **61**–03/08/1967: 1m#, Di Giovanni *et al.* 2004. **82**–03/08/1967: 1m#, f#f#, Di Giovanni *et al.* 2004. **95**–Moretti *et al.* 1993. **119**–25/08/1993: 1m#(L), 1f#(L), Cianficconi *et al.* 1999b. **120**–11/04/1996: 2m#, 1f#, Giovannini. **121**–04/07/1996: 3m#, 2f#, Giovannini. **122**–22/08/1983:

9m#(L), Salerno. **123**–27/07/1998: 5m#, 2f#, Meniconi. **125**–07/10/1999: 1m#, Meniconi. **Marche:** **11**–Moretti *et al.* 1997. **15**–14/07/1947: 75 l, Cianficconi *et al.* 2007. **16**–Cianficconi *et al.* 2007. **17**–Cianficconi *et al.* 2007. **18**–15/09/1947: 9 p, 15 l, Moretti. 27/07/1955: 1m#, Cianficconi *et al.* 2007. **20**–Cianficconi *et al.* 2007. **21**–15/09/1947: 9 p, 15 l Cianficconi *et al.* 2007. **22**–Cianficconi *et al.* 2007. **23**–4/8/47: 3 l, Cianficconi *et al.* 2007. **26**–09/08/1953: 1m#, 2f#, 16 l; 09/08/1955: 1m#, 8f# Cianficconi *et al.* 2007. **27**–09/08/1953: 2m#, 8f#; 09/09/1953: 1m#; 09/08/1955: 1m#, 8f#, Bellini. **31**–04/04/1952: 1m#, 1 l; 09/05/1953: 2m#, 1f#, Di Giovanni *et al.* 2004; 04/04/1954: 1m#, 1 p, Cianficconi *et al.* 2007. **32**–30/03/1948: 1m#, Cianficconi *et al.* 2007. **33**–04/04/1954: 1m#, Di Giovanni *et al.* 2004. **Lazio:** **3**–11/07/1985: 2f#, Ronca. **Abruzzo:** **2**–02/07/1953: 1m#, 1f#; 25/08/1953: 3m#, 4f#, Formicone. **Campania:** Cianficconi *et al.* 2002. **Puglia:** **1**–08/06/1972: 1m#, 1f#, Di Giovanni *et al.* 2004; 01/10/1979: 1m#, 1f#, Terragno. **Basilicata:** **1**–22/05/1984: 1m#, Di Giovanni *et al.* 2004; 13/06/1984: 1m#, Chiappafreddo. **2**–22/05/1984: 1m#, Cianficconi *et al.* 1986. **3**–02/08/1993: 4m#, Cianficconi *et al.* 1993. **4**–02/08/1993: 5m#, Cianficconi *et al.* 1993. **7**–22/5/84: 1m# Cianficconi *et al.* 1986. **9**–01/05/1982: 13 l, Cianficconi *et al.* 1986. **12**–22/05/1984: 1m#, Di Giovanni *et al.* 2004. **Calabria:** **1**–12/09/1983: 1, Cianficconi *et al.* 1986. **2**–13/09/1983: 3m#, 1f#, Di Giovanni *et al.* 2004; 26/09/1983: 1m#, 1pf#, Cianficconi *et al.* 1986. **5**–04/06/1991: 1m#, Cianficconi *et al.* 1993. **6**–12/09/1983: 1m#, 2f#, 1, Di Giovanni *et al.* 2004; 02/02/1982: 1m#, Di Giovanni *et al.* 2004. **7**–02/05/1982: 1m# Cianficconi *et al.* 1986. **8**–07/07/1989: 3m#, 2f#, Pignatari. **9**–22/08/1989: 3m#, 3f#, Di Giovanni *et al.* 2004. **10**–22/08/1989: 4m#, Di Giovanni *et al.* 2004. **13**–29/07/1993: 2m#, 4f#, 1 l, Cianficconi *et al.* 1993. **14**–30/07/1993: 2m#, Cianficconi *et al.* 1993. **Sicilia:** **2**–06/09/1978: 23m#, 8f#, Cianficconi *et al.* 1999a. **3**–25/08/1987: 1f#, Cianficconi *et al.* 1999a. **4**–02/04/1986: 1f#, Cianficconi *et al.* 1999a. **5**–02/04/86: 1f#, Di Giovanni *et al.* 2004. **8**–18/07/1989: 1 p, 1 l, Cianficconi *et al.* 1999a; 02/05/1996: 1m#, De Pietro. **9**–12/04/1961: 13m#, 2f#, Di Giovanni *et al.* 2004. **10**–12/09/1978: 1m#, 1f#, Di Giovanni *et al.* 2004. **13**–21/09/1976: 1m#, 1pm#, Riggio; 09/09/1986: 1m#, 1f#, Cianficconi *et al.* 1999a. **14**–21/09/1976: 1f#, Cianficconi *et al.* 1999a. **15**–09/09/1976: 2pm#, 1pf#; 21/09/1976: 1f#, Cianficconi *et al.* 1999a. **17**–19/11/1985: 2m#, Chiappafreddo, Cianficconi. **18**–23/11/1985: 1m#; 24/11/1985: 13m#, 1f#, Di Giovanni *et al.* 2004. **19**–19/11/1985: 15m#, 2f#, Cianficconi *et al.* 1999a. **20**–11/09/1978: 2m#, 32f#, Di Giovanni *et al.* 2004. **22**–12/08/1985: 1f#, 1 l, Gereke; 26/08/1992: 1m#, Cianficconi *et al.* 1999a. **23**–25/08/1986: 4 epc; 20/02/1989: 1m#, Di Giovanni *et al.* 2004; 20/02/1989: 1m#, Cianficconi *et al.* 1999a. **24**–25/08/1987: 1m#, Cianficconi *et al.* 1999a. **26**–22/11/1985: 4m#, 3f#, 1pm#, 3 l, Cianficconi *et al.* 1999a. **27**–21/11/1985: 1m#, Cianficconi *et al.* 1999a. **28**–09/09/1986: 1m#, 1f#, 1 p, Cianficconi *et al.* 1999a. **30**–11/09/1985: 1m#, 1f#, 1 l, Gereke. **32**–04/04/1996: 2m#; 02/05/1996: 1 p, Cianficconi *et al.* 1999a. **33**–04/04/1996: 2 p, Cianficconi *et al.* 1999a. **36**–11/09/1985: 1, Cianficconi *et al.* 1999a. **Sardegna:** **1**–Moretti & Cianficconi 1983. **2**–19/05/1980: 1m#; 22/05/1980: 1m#, Moretti & Cianficconi 1983. **4**–04/09/1965: 10pm#, 5pf#, Di Giovanni *et al.* 2004. **11**–04/08/1936: 1m#, Moretti 1940. **13**–30/05/1964: 1m# Moretti & Cianficconi 1983; 15/05/1986: 1m#, Moretti. **15**–coll. Malicky. **16**–31/05/1964: 2m#, 1f#, Moretti & Cianficconi 1983. **17**–Cianficconi *et al.* 1996. **19**–Cianficconi *et al.* 1996. **20**–06/04/1988: 1m#, Di Giovanni 04/10/1988: 1m#, Azara. **22**–Cianficconi *et al.* 1996. **23**–27/05/1964: 1m#, 3f#, Moretti & Cianficconi 1983. **24**–Cianficconi *et al.* 1996. **25**–Cianficconi *et al.* 1996. **26**–14/06/1987: 1 l; 04/10/1988: 10 l; 11/04/1988: 1m#, Azara. **27**–07/01/1988: 1 l; 05/04/1988: 45pm#, 25 l, Azara. **28**–Cianficconi *et al.* 1996. **29**–Cianficconi *et al.* 1996. **30**–13/03/1990: 1m#, 1f#, Di Giovanni *et al.* 2004. **34**–03/06/1964: 4m#, Moretti. **35**–03/06/1964: 4m#, Moretti & Cianficconi 1983. **40**–01/03/1964: 1m#(L); 03/06/1964: 1m#(L), Moretti 1983; 22/05/1980: 1m#, Cianficconi, Gianotti, Viganò. **43**–22/10/1971: 6m#, Moretti & Cianficconi 1983. **46**–04/09/1965: 10 l, Pirisinu. **49**–Moretti & Cianficconi 1983. **Elba:** **1**–30/07/1957: 2m#; 20/08/1957: 3m#, 2f#, 5 l; 30/08/1957: 2m#, 1f#; 03/10/1958: 5 l, Di Giovanni *et al.* 2004.

27. *Hydroptila vichtaspa* Schmid, 1959

Lombardia: **33**–27/06/1995: 1f#(L); Bertuetti *et al.* 2005. **15**–23/07/1994: 1m#, 1f#; 25/07/1995: 1m#(L); Bertuetti *et al.* 2005. **33**–27/06/1995: 1f#(L); Bertuetti *et al.* 2005. **Umbria:** **125**–00/00/1998: 2m#, 1f#, 1 l, Meniconi.

Discussion and Conclusions

Our study is an updated review of the systematics, faunistics and ecology of the genus *Hydroptila* in Italy. In the Italian peninsula and islands, 27 species were found which constitute 65.8% of the European *Hydroptila*

species. The highest number of species was found in Umbria with 15 species and 13 species were found in both Toscana and Piemonte. No *Hydroptila* species were found in Valle d'Aosta. Three species are present only in Sardegna (*H. fiorii*, *H. serrata*, *H. cortensis*). The latter was found only in Ussassai – site 49 of Table 1. *Hydroptila tacheti* was found in Friuli-Venezia Giulia only. The most widespread species are *H. vectis*, found in 18 regions, and *H. angulata*, found in 16 regions.

Data on research carried out from 1873 to 2012, *Hydroptila* specimens were collected in 434 of 4513 examined biotopes. Some species living in lotic waters (*H. vectis*, *H. angulata*, among others) are euryoecious and tolerate higher values of organic matter, H₂S and NO₃⁻, while madicolous, crenal and rithral species live in unpolluted waters. *Hydroptila sparsa* was found in brackish waters (Cianficconi *et al.* 2001).

It is important to extend the research in those regions which lack species (Valle d'Aosta) or have a low number of species and to carry out more nocturnal samplings using light traps.

The scent organs located on the male head of many *Hydroptila* species have been studied for a long time (Eltringham 1920; Moretti & Bicchierai 1979; Moretti & Cianficconi 1964a, 1964b; Mosely 1920; Roemhild 1980). Our histological and ultrastructural investigation shows the secretory activity of these complex structures but the role played by the secretion has not yet been determined. Similar organs (Moretti & Bicchierai 1980), variously located on the insect body in the sister order Lepidoptera have been proven to be sex pheromone glands, indicating the probable role of *Hydroptila* scent organs as structures which release sex attractants.

The catalogue here reported is a complete and updated list of the *Hydroptila* species found in Italy up to 2012, indicating also the number of specimens (at any developmental stage) collected in each collection site and the related references when available.

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