

Short notes

In this section 218 species of arthropods are recorded, collected in Sardinia mainly during the researches carried out by CNBFVR (cf. Bardiani 2011). All or part of the records of most species (207) come from the Marganai and/or Montimannu wilderness areas. They belong to taxa not treated in the previous pages nor by Cerretti et al. (2009). All taxa are listed in alphabetical order according to the nomenclature and systematics of the Fauna Europaea Web Service (de Jong 2011) unless otherwise stated. Collecting sites from the region-owned forests of Marganai and Montimannu and neighbouring areas are listed under "Records", while those from other Sardinian sites are listed under "Other records". Almost all the sites investigated during the faunistic survey carried out by CNBFVR on the island are indicated with abbreviations (see further on), while all the other sites are listed in full. All sites and/or their abbreviations are listed in alphabetical order. Sites listed in full are listed after those abbreviated, alphabetically according to province. Further details on most of the sampling sites are provided by Bardiani (2011). The material, unless otherwise stated, is stored in the CNBFVR collection.

ABBREVIATIONS

CNBFVR SAMPLING SITES. **A01** = Medio Campidano prov., Arbus, Piscinas, dune, 0 m, 32S 452927 4376897; **A02** = Medio Campidano prov., Arbus, Marina di Arbus, 10 m, 32S 454504 4383252; **A04** = Oristano prov., Arborea, Stagno di s'Ena Arrubia, 0 m, 32S 462842 4408878; **A05** = Carbonia-Iglesias prov., Buggerru, R. Mannu, foce, dune, 3 m, 32S 449437 4365545; **A06** = Carbonia-Iglesias prov., Buggerru, Cala Domestica, 10 m, 32S 446540 4358436; **A08** = Medio Campidano prov., Arbus, Capo Pecora, 15 m, 32S 446760 4367599; **A09** = Medio Campidano prov., Arbus, Piscinas, guado del R. Piscinas, 18 m, 32S 454087 4376193; **A10** = Oristano prov., San Vero Milis, sa Marigosa, spiaggia, 5 m, 32T 448490 4432720; **A11** = Oristano prov., San Vero Milis, sa Marigosa, stagno, 5 m, 32T 449217 4432397; **A12** = Cagliari prov., Domus de Maria, Torre di Chia, spiaggia di Su Portu, 1 m, 32S 490072 4305296; **A13** = Carbonia-Iglesias prov., Sant'Anna Arresi, Porto Pino, dune, 5 m, 32S 467025 4311362; **A15** = Carbonia-Iglesias prov., Gonnese, Plage Mesu, Sa Punta e s'Arena, 5 m, 32S 450884 4347330; **A16** = Carbonia-Iglesias prov., Gonnese, Fontanamare, 3 m, 32S 451423 4348717; **A17** = Carbonia-Iglesias prov., Fluminimaggiore, Portixeddu, 6 m, 32S 449437 4365741; **A18** = Carbonia-Iglesias prov., Sant'Antioco, Stagno di S. Caterina, 0 m, 32S 455569 4326716; **A19** = Carbonia-Iglesias prov., Sant'Antioco, Capo Sperone, spiaggia, 0 m, 32S 451831 4314957; **A21** = Oristano prov., Terralba, Stagno di Marceddi, 0 m, 32S 457917 4397594; **C01** = Carbonia-Iglesias prov., Iglesias, Case Marganai, 725 m, 32S 463890 4355925; **C02** = Carbonia-Iglesias prov., Iglesias, Pta Serra Pirastu, 656 m, 32S 463237 4355678; **C03** = Carbonia-Iglesias prov., Iglesias, Vecchia Cantoniera Marganai, 491 m, 32S 462272 4354677; **C05** = Carbonia-Iglesias prov., Iglesias, Pta Cungiaus, 636 m, 32S 462440 4355161; **C06** = Carbonia-Iglesias prov., Domusnovas, Grotta di S. Giovanni, 325 m, 32S 467900 4354891; **C07** = Carbonia-Iglesias prov., Domusnovas, dint. Planargia - Scoveri, 625 m, 32S 465523 4362921; **C08** = Carbonia-Iglesias prov., Domusnovas, Valle Oridda, pineta, 595 m, 32S 466970 4362400; **C10** = Medio Campidano prov., Villacidro, dint. Pta piscina Argiolas, Serbatoio, 282 m, 32S 472049 4360081; **C11** = Medio Campidano prov., Villacidro, Can.li Serci, 381 m, 32S 472208 4359497; **C12** = Medio Campidano prov., Villacidro, Can.li s'Otti, versante destro, 520 m, 32S 471690 4359611; **C13** = Medio Campidano prov., Villacidro, dint. Pta Pranu Ilixis, 563 m, 32S 471221 4359310; **C14** = Carbonia-Iglesias prov., Domusnovas, Sedda Pranu Cardu, 549 m, 32S 470926 4358924; **C15** = Carbonia-Iglesias prov., Domusnovas, Gutturu Seu, 140 m, 32S 471646 4355238; **C16** = Carbonia-Iglesias prov., Domusnovas, Gutturu Seu, 174 m, 32S 471577 4355716; **C19** = Medio Campidano prov., Villacidro, R. Cannisoni, 375 m, 32S 468713 4362692; **C20** = Medio Campidano prov., Villacidro, R. Cannisoni, 382 m, 32S 468980 4362541; **C22** = Medio Campidano prov., Villacidro, R. Cannisoni, sorg. s'acqua Frischedda, 372 m, 32S 468391 4362826; **C23** = Medio Campidano prov., Villacidro, R. Cannisoni, radura sponda sinistra, 401 m, 32S 468459 4362806; **C25** = Medio Campidano prov., Villacidro, Can.le Monincu, 450 m, 32S 468040 4363436; **C26** = Carbonia-Iglesias prov., Domusnovas, Bega d'Aleni, 621 m, 32S 467855 4361336; **C27** = Medio Campidano prov., Gonnosfanàdiga, M. Idda, strada per M. Linas, 474 m, 32S 466946 4368997; **C28** = Medio Campidano prov., Gonnosfanàdiga, sa Pta de s'Erbaceu, strada per M. Linas, 744 m, 32S 465989 4368410; **C29** = Medio Campidano prov., Gonnosfanàdiga, Genna Mirratta, 794 m, 32S 465363 4366138; **C30** = Medio Campidano prov., Gonnosfanàdiga, dint. Ovile Linas, 710 m, 32S 466346 4365201; **C31** = Carbonia-Iglesias prov., Domusnovas, L. Siuru, 322 m, 32S 467069 4357916; **C32** = Medio Campidano prov., Villacidro, L. di Montimannu, diga, 255 m, 32S 475380 4363486; **C33** =

Carbonia-Iglesias prov., Domusnovas, dint. P.ta Planotzara, 360 m, 32S 465515 4356209; **C34** = Carbonia-Iglesias prov., Domusnovas, R. sa Duchessa, greto del R., 270 m, 32S 466700 4356979; **C35** = Carbonia-Iglesias prov., Iglesias, Mamenga, 610 m, 32S 462170 4356618; **C36** = Medio Campidano prov., Villacidro, dint. L. di Montimannu, lungo T. Leni, 256 m, 32S 474156 4363150; **C39** = Carbonia-Iglesias prov., Iglesias, Cuccuruneddu, hill top, 708 m, 32S 472379 4357784; **C41** = Carbonia-Iglesias prov., Domusnovas, su Pranu Pirastu, 147 m, 32S 471365 4353536; **C42** = Carbonia-Iglesias prov., Iglesias, Conca Margiani, 750 m, 32S 462440 4356936; **C43** = Carbonia-Iglesias prov., Iglesias, Conca Margiani, radura, 725 m, 32S 462470 4357011; **C44** = Carbonia-Iglesias prov., Iglesias, Conca Margiani, radura lungo strada, 700 m, 32S 462635 4356866; **C45** = Carbonia-Iglesias prov., Iglesias, dint. P.ta Genna Ollioni, 750 m, 32S 462840 4356811; **C46** = Medio Campidano prov., Villacidro, R. Cannisoni, 400 m, 32S 468858 4362543; **C47** = Carbonia-Iglesias prov., Domusnovas, Valle Oridda, sorg., 590 m, 32S 466681 4362696; **C48** = Carbonia-Iglesias prov., Domusnovas, P.ta Piloni de sa Figù, 750 m, 32S 465958 4360742; **C49** = Medio Campidano prov., Villacidro, T. Leni, 300 m, 32S 471317 4360510; **C50** = Medio Campidano prov., Villacidro, C. Sarais, 251 m, 32S 474215 4361145; **C51** = Carbonia-Iglesias prov., Iglesias, dint. P.ta Campu Spina, 760 m, 32S 462466 4358236; **C52** = Carbonia-Iglesias prov., Iglesias, dint. S. Benedetto, 550 m, 32S 459499 4358405; **C53** = Medio Campidano prov., Gonnosfanàdiga, M. Linas, P.ta su Filixi, 780 m, 32S 465819 4368289; **C54** = Medio Campidano prov., Gonnosfanàdiga, M. Linas, Genna su Pamenti, 853 m, 32S 465485 4367656; **C55** = Medio Campidano prov., Gonnosfanàdiga, M. Linas, Genna Mirratta, sorgente, 793 m, 32S 465136 4366226; **C56** = Medio Campidano prov., Gonnosfanàdiga, M. Linas, Genna sa Xirra, 847 m, 32S 464114 4366023; **C58** = Medio Campidano prov., Villacidro, dint. P.ta piscina Argiolas, rigagnolo, 282 m, 32S 472049 4360081; **C59** = Medio Campidano prov., Villacidro, dint. M. Anzeddu, 500 m, 32S 469031 4361072; **C60** = Carbonia-Iglesias prov., Domusnovas, dint. Gutturu Abis, 580 m, 32S 468140 4360761; **C61** = Carbonia-Iglesias prov., Domusnovas, dint. P.ta su Fenu, 250 m, 32S 467159 4356713; **C63** = Carbonia-Iglesias prov., Iglesias, dint. P.ta Fenu, 300 m, 32S 472097 4357122; **C64** = Carbonia-Iglesias prov., Iglesias, dint. P.ta Fenu, 225 m, 32S 471850 4356980; **C66** = Carbonia-Iglesias prov., Buggerru, dint. Grugua, 530 m, 32S 454376 4359900; **C67** = Carbonia-Iglesias prov., Buggerru, dint. Miniera S. Luigi, 347 m, 32S 452771 4358704; **C68** = Carbonia-Iglesias prov., Domusnovas, dint. sa Duchessa, 320 m, 32S 466164 4358209; **C69** = Carbonia-Iglesias prov., Domusnovas, dint. sa Duchessa, strada per Perda Niedda, 350 m, 32S 466233 4359025; **C70** = Carbonia-Iglesias prov., Iglesias, dint. Case Marganai, 660 m, 32S 463341 4356196; **C71** = Carbonia-Iglesias prov., Domusnovas, dint. P.ta Genna Ollioni, 650 m, 32S 463293 4356570; **C72** = Carbonia-Iglesias prov., Domusnovas, dint. P.ta Planotzara, 309 m, 32S 465718 4356515; **C74** = Medio Campidano prov., Villacidro, dint. T. Leni, eucalipteto, 300 m, 32S 469793 4361088; **C77** = Carbonia-Iglesias prov., Iglesias, dint. Case Marganai, car net from C85 to C01, 650 m; **C80** = Carbonia-Iglesias prov., Domusnovas, M.ti Marganai, Miniera Reigraxius, 465 m, 32S 464160 4357039; **C81** = Carbonia-Iglesias prov., Domusnovas, Valle Oridda, 643 m, 32S 465399 4362770; **C82** = Carbonia-Iglesias prov., Iglesias, M.ti Marganai, Tintillonis, 480 m, 32S 462590 4355061; **C84** = Carbonia-Iglesias prov., Iglesias, S. Benedetto, 500 m, 32S 459882 4357019; **C85** = Carbonia-Iglesias prov., Iglesias, M.ti Marganai, 540 m, 32S 463010 4355249; **G01** = Nuoro prov., Oliena, M. Maggione, 624 m, 32T 535451 4456520; **G02** = Nuoro prov., Oliena, P.ta sos Nidos, 986 m, 32T 536075 4456422; **G03** = Nuoro prov., Oliena, Oliena, 424 m, 32T 534746 4457479; **G04** = Nuoro prov., Orgosolo, Oristillai, 947 m, 32T 529688 4446725; **G05** = Ogliastra prov., Seui, dint. M. Tonneri, 876 m, 3 S 530745 4410020; **G06** = Ogliastra prov., Seui, dint. M. Tonneri, sorg. Nuletta, 892 m, 32S 531716 4412341; **G07** = Ogliastra prov., Seui, dint. M. Tonneri, Sa ucca 'e su Oe, 912 m, 32S 531228 4413496; **G08** = Ogliastra prov., Seui, dint. M. Tonneri, 919 m, 32S 530651 4412895; **G09** = Cagliari prov., Villanovatulo, dint. Nuraghe is Cangialis, 373 m, 32S 517956 4400645; **G11** = Cagliari prov., Sinnai, dint. M. Castangia, 584 m, 32S 532700 4351568; **G12** = Cagliari prov., Burcei, dint. Burcei, 631 m, 32S 528639 4356088; **G13** = Cagliari prov., Burcei, dint. Burcei, 725 m, 32S 528219 4356591; **G14** = Cagliari prov., Burcei, dint. P.ta Serpeddì, 785 m, 32S 526996 4356738; **G15** = Cagliari prov., Burcei, dint. P.ta Serpeddì, 954 m, 32S 525266 4356808; **G31** = Medio Campidano prov., Gesturi, Giara di Gesturi, 568 m, 32S 495926 4401318; **G35** = Nuoro prov., Lodé, S. Anna, strada per Siniscola, 490 m, 32T 554459 4491980; **G36** = Nuoro prov., Lula, dint. Lula, 530 m, 32T 542525 4480254; **G39** = Ogliastra prov., Talana, dint. Talana, 478 m, 32T 542523 4433941; **G41** = Ogliastra prov., Gairo, M. Perda Liana, 1219 m, 32S 535096 4417848; **G44** = Nuoro prov., Desulo, R. Aratu, 958 m, 32T 521882 4431913; **G46** = Nuoro prov., Gadoni, F. Flumendosa, riva, 402 m, 32S 516364 4416019; **G49** = Cagliari prov., Nurri, dint. Nuraghe Tacquara, fontana, 533 m, 32S 515371 4395479; **G50** = Oristano prov., Cabras, Tharros, 9 m, 32S 452048 4414023; **G51** = Cagliari prov., Vallermosa, dint. Cant. de s'Acquacotta, 83 m, 32S 483910 4361992; **G52** = Ogliastra prov., Seui, dint. M. Tonneri, 825 m, 32S 533277 4411585; **G54** = Ogliastra prov., Gairo, M. Tonneri, lecceta, 1020 m, 32S 530263 4415529; **G55** = Ogliastra prov., Gairo, M. Tonneri, dint. nuraghe Ardassai, lecceta, 1020 m, 32S 529111 4415819; **G56** = Ogliastra prov., Seui, Seui, 800 m, 32S 527585 4409970; **S1** = Carbonia-Iglesias prov., Iglesias, dint. colonia Beneck, 636 m, 32S 462391 4355441; **S2** = Carbonia-Iglesias prov., Domusnovas, sa Duchessa, 371 m, 32S 464990 4358384; **S3** = Carbonia-Iglesias prov., Domusnovas, Valle Oridda, 592 m, 32S 466973 4362228; **SAR1** = Carbonia-Iglesias prov., Iglesias, Marganai, plot CONECOFOR SAR1, 700 m, 32S 462853 4355582.

COLLECTORS. AB = A. Briganti; AD = A. Dodero; AK = A.H. Krausse; AM = A. Campanaro; AMo = A. Molinu; AT = A. Tenga; BM = B. Merz; CG = C. Giusto; CM = C. Meloni; CT = C. Torti; DA = D. Avesani; DB = D. Birtele; DD = D. Deidda; DW = D. Whitmore; EB

= E. Braga; EG = E. Gatti; EM = E. Minari; FC = F. Chessa; FM = F. Mason; FMa = F. Mazzocchi; GC = G. Chessa; GGa = G. Gardini; GGr = G. Grafitti; GN = G. Nardi; GS = G. Scaglioni; GZ = G. Zandi; IMA = I. Marcellino; JW = J. De Waele; LB = L. Briganti; L? = no collector mentioned; LF = L. Fancello; LS = L. Spada; MA = M. Armeni; MB = M. Bardiani; ME = M. Eggenberger; MM = M. Mei; MMu = M. Mucedda; MR = M. Rampini; MT = M. Tisato; MTr = M. Trizzino; MZ = M. Zapparoli; NS = N. Sanfilippo; PA = P. Audisio; PCe = P. Cerretti; PCo = P. Cornacchia; PL = P. Leo; RA = R. Argano; RM = R. Manconi; RRz = R. Rizzerio; SRi = S. Riese; SZ = S. Zoia; VC = V. Cottarelli; VV = V. Vomero.

SAMPLING METHODS. al = collecting at light; ba = bait (small pieces of meat mixed with hay placed in an open plastic tube); bz = glass trunk trap (beer and sugar); cn = car net; dc = direct collecting; lt = light trap; mt = Malaise trap; nt = hand net; oe = entomological umbrella; pt = pitfall trap (vinegar and salt); sn = sweep net; vg = sieve; wn = water net; wt = window flight trap.

OTHER ABBREVIATIONS AND RECURRENT TERMS USED IN FAUNISTIC LIST. C. = Casa = House; Can.le = Canale = Canal; Can.li = Canali = Canals; Cant. = Cantoniera = Roadman's house; coll. = collection; D = deutonymph/s; dint. = surroundings of; ex = specimen/s; dune = dunes; eucalipreto = eucalyptus plantation; foce = river mouth; F. = Fiume = River; Foresta = Forest; fontana = fountain; greto del = bed of [river]; Grotta = Cave; ingresso = entrance of; Isola = Island; L. = Lago = Lake; lecceta = holm-oak forest; leg. = collector/s; litoranea = coastal road; loc. = locality; Miniera = Mine; M. = Monte = Mount; M.ti = Monti = Mounts; P = protonymph/s; pineta = pinewood; prov. = province; P.ta = Punta = Peak; R. = Rio = stream; radura = clearing; radura con = clearing with; radura lungo strada = clearing alongside road; reg. = region; rigagnolo = rivulet; riva = bank; S. = San/Santa/Santo = Saint; sdb = same data but; Serbatoio = Reservoir; sorg. = sorgente = spring; sotto corteccia = under bark; spiaggia = beach; sponda sinistra = left bank; Stagno = Pond; strada = road; strada per = road to; su cadavere di = on carcass of; T. = Torrente = Torrent; tfi = translation from Italian; Tr = tritonymph/s; versante = slope; Valle = Valley; verso = in direction of; wdc = without date of collection.

DEPOSITORIES. CGG = G. Gardini collection (Genoa, Italy); CGN = G. Nardi collection (Cisterna di Latina, Latina, Italy); CGP = G. Platia collection (Gatteo, Forlì-Cesena, Italy); CKR = K. Rognes collection (Stavanger, Norway); CMM = M. Mei collection (Rome, Italy); CNBFVR = Centro Nazionale per lo Studio e la Conservazione della Biodiversità Forestale "Bosco Fontana" di Verona (Marmirolo, Mantua, Italy); CPC = P. Cornacchia collection (Porto Mantovano, Mantua, Italy); MHNG = Muséum d'histoire naturelle (Genève, Switzerland); MSNM = Museo Civico di Storia Naturale di Milano (Milan, Italy); MCZR = Museo Civico di Zoologia (Rome, Italy); TCUB = M. von Tschirnhaus collection, University of Bielefeld (Bielefeld, Germany); ZSM = Zoologische Staatssammlung München (Munich, Germany).

Quotation-sample of single notes:

Podenas S., 2011. Short notes 15. Diptera, Limoniidae, pp. 862-866. In: Nardi G., Whitmore D., Bardiani M., Birtele D., Mason F., Spada L. & Cerretti P. (eds), Biodiversity of Marganai and Montimannu (Sardinia). Research in the framework of the ICP Forests network. Conservazione Habitat Invertebrati, 5. Cierre Edizioni, Sommacampagna, Verona.

REFERENCES

- Bardiani M., 2011. Introduction, pp. 15–56. In: Nardi G., Whitmore D., Bardiani M., Birtele D., Mason F., Spada L. & Cerretti P. (eds), Biodiversity of Marganai and Montimannu (Sardinia). Research in the framework of the ICP Forests network. Conservazione Habitat Invertebrati, 5. Cierre Edizioni, Sommacampagna, Verona.
- Cerretti P., Mason F., Minelli A., Nardi G. & Whitmore D., 2009. Foreword, pp. 5–7. In: Cerretti P., Mason F., Minelli A., Nardi G. & Whitmore D. (eds), Research on the terrestrial Arthropods of Sardinia. Zootaxa, 2318.
- de Jong Y.S.D.M. (ed.), 2011. Fauna Europaea version 2.4. Web Service available online at <http://www.faunaeur.org> [accessed 1 September 2011 as version 2.4 of 27 January 2011].

14. Diptera, DROSOPHILIDAE

Gerhard BÄCHLI

Zoologisches Museum, Universität Zürich-Irchel, Winterthurerstrasse 190, CH-8057 Zürich, Switzerland.

E-mail: gerhard.baechli@uzh.ch

Drosophilidae are relatively small flies (mostly 2–4 mm long, usually either yellowish-brown with dark brown patterns of points, stripes or bands, or almost unicolorously dark brown). Most species can be recognized by the conspicuously plumose arista, the wing with two costal breaks, and the three orbital setae. The biology of the family is very diverse (Ashburner et al. 2005). Most species of the subfamily Drosophilinae concentrate around fermenting or decaying plant material, whereas *Scaptomyza* Hardy, 1849 and *Lordiphosa* Basden, 1961 species are common in the herb layer. Drosophilids occur in all terrestrial habitats, from lowlands up to alpine meadows. Some of the synanthropic (domestic) species are artificially reared and are extremely important laboratory animals for science. The larvae of most species feed on microorganisms and develop in substrates which may be different from the substrates frequented by the adults (Ferrar 1987; Bächli et al. 2004).

Around 4,000 species of Drosophilidae have been described (Brake & Bächli 2008; Bächli 2009). About 120 species, including a few recent immigrants, occur in Europe and adjacent islands of the Macaronesian subregion (Bächli et al. 2004).

In the present note, 18 species of Drosophilidae are reported for Sardinia, based mainly on material collected by CNBFVR in the Marganai and Montimannu areas in the south-western part of the island (cf. Mason et al. 2006; Cerretti et al. 2009). Four species are recorded for the first time, increasing the known drosophilid fauna of the island from 5 to 18 confirmed species (cf. Bächli et al. 1995). Species are listed in alphabetical order. Localities are mentioned as given on the labels (unpublished records) or in the literature (published records). The specimens are predominantly stored in ethanol, in addition to a few pinned samples, and deposited in the collection of CNBFVR.

Cacoxenus indagator Loew, 1858

RECORDS. **C23**: 19–24.V.2006, MB DB PCo DW, pt, 1 ex. **S1**: 18.IV–2.V.2006, GC, mt, 3 ex; 2–16.V.2006, GC, mt, 11 ex; 16–30.V.2006, GC, mt, 4 ex. **S2**: 18.IV–2.V.2006, GC, mt, 9 ex; 2–16.V.2006, GC, mt, 4 ex.

NOTES. A widespread West Palearctic species. The

larvae live in nests of solitary bees of the genus *Osmia* Panzer, 1806 (Hymenoptera, Apidae) and adults can be observed flying around the nest openings. New record for Sardinia.

Drosophila ambigua Pomini, 1940

RECORDS. **C11**: 11.XI.2006, DW, nt, 1 ex. **C31**: 12–17.VII.2006, DA MB DB PCe MM DW, mt, 7 ex. **C82**: 11–12.VI.2004, DB PCe GN MT DW, mt, 26 ex. **S1**: 13–27.VI.2006, GC, mt, 1 ex. **SARI**: 15–30.VI.2004, GC, pt, 7 ex; 30.VI–16.VII.2004, GC, pt, 104 ex; 16.VII–1.VIII.2004, GC, pt, 6 ex; 1–16.VIII.2004, GC, pt, 3 ex; 21.IX–6.X.2004, GC, pt, 4 ex; 5.VIII–13.IX.2005, GC, pt, 3 ex.

NOTES. *Drosophila ambigua* is a widespread West Palearctic species, introduced in western North America and South America a few decades ago. Pomini's type material was from London and Cagliari (Foresta Demaniale dei "sette fraris") (Pomini 1940: 159). Records of *D. ambigua* are rather sporadic, but locally it is not rare, as shown above: more than three quarters of the specimens were found at two localities; the collections were dominated by females.

Drosophila busckii Coquillett, 1901

RECORDS. **C31**: 12–17.VII.2006, DA MB DB PCe MM DW, mt, 1 ex. **C82**: 11–12.VI.2004, DB PCe GN MT DW, mt, 64 ex; 12.VI.2004, DB PCe GN MT DW, mt, 10 ex. **SARI**: 16.VI–14.VII.2005, GC, mt, 1 ex.

OTHER RECORDS. **Nuoro prov.**: "Sardinien, Belvì, 24.IV.1977", 1 ex (ZSM).

NOTES. This is a domestic species, locally not rare, as enumerated above. About two thirds of the specimens were females. *Drosophila busckii* can be the dominant species around decaying potatoes, onions etc., where the larvae can equally be found.

Drosophila buzzatii Patterson & Wheeler, 1942

RECORDS. **C10**: 12.IX.2005, DA MB DB GN, lt, 1 ex.

NOTES. The origin of this species is most probably Central America, but it is now found almost worldwide where Prickly Pears (*Opuntia* sp.) have been planted. Therefore, it is a cosmopolitan species, but not really domestic. Ruiz et al. (1984) mentioned *D. buzzatii* from Santa Teresa [di Gallura] (Olbia-Tempio prov.) as part of a study of its Mediterranean chromosomal polymorphism.

Drosophila funebris (Fabricius, 1787)

RECORDS. **S2**: 21.III–4.IV.2006, GC, mt, 1 ex.

OTHER RECORDS. **Nuoro prov.**: "Sardinien, Belvì, 24.IV.1977", 1 ex (ZSM).

NOTES. This is a domestic species usually found in stables and other domestic habitats. Its distribution is worldwide but it occurs predominantly in cooler areas.

Drosophila hydei Sturtevant, 1921

RECORDS. **S2**: 17–31.X.2006, GC, mt, 1 ex.

NOTES. This is a domestic species usually found around fruits. Its distribution is worldwide, but it is predominant in warmer areas. New record for Sardinia.

Drosophila immigrans Sturtevant, 1921

RECORDS. **C82**: 11–12.VI.2004, DB PCe GN MT DW, mt, 1 ex. **SAR1**: 15–30.VI.2004, GC, pt, 2 ex; 30.VI–16.VII.2004, GC, pt, 1 ex.

OTHER RECORDS. **Nuoro prov.**: Dorgali, Rio Flumineddu, Gola di Gorropu, 350 m, 40.11.04 N, 9.29.58 E, 15.VI.2002, BM ME, 1 ex (MHNG).

NOTES. *Drosophila immigrans* is supposed to originate from southern Asia and was introduced in America and Europe at the beginning of the 20th century. It has since become a domestic species with a worldwide distribution; locally and temporarily it can be the dominant species.

Drosophila melanogaster Meigen, 1830

RECORDS. **S1**: 13–27.VI.2006, GC, mt, 1 ex; 16–30.V.2006, GC, mt, 1 ex; 27.VI–11.VII.2006, GC, mt, 2 ex. **S3**: 11–25.VII.2006, GC, mt, 1 ex.

OTHER RECORDS. **Nuoro prov.**: "Sardinien, Belvì, 24.IV.1977" (ZSM).

NOTES. *Drosophila melanogaster* is the most common domestic *Drosophila* Fallén, 1823 species and has been used as a laboratory animal during the past 100 years and more in almost all biological disciplines. In addition, its polymorphism in natural populations has been studied worldwide, also in Sardinian populations from Arborea (Oristano prov.), Dorgali (Nu-

oro Prov.), Olbia (Olbia-Tempio prov.), Serpentara and Villasor (Cagliari prov.) and Tortoli (Ogliastra prov.) (Halfer 1981; Carton 1984; Cicchetti et al. 1990). There are two doubtful records from Asuni (Oristano prov.) by Krausse (1910, 1914). Surprisingly, very few specimens were collected during the current project.

Drosophila phalerata Meigen, 1830

RECORDS. **C10**: 14.XI.2006, DW, nt, 1 ex. **C82**: 11–12.VI.2004, DB PCe GN MT DW, mt, 76 ex; 12.VI.2004, DB PCe GN MT DW, mt, 2 ex. **S2**: 30.V–13.VI.2006, GC, mt, 1 ex; 17–31.X.2006, GC, mt, 1 ex. **SAR1**: 15–30.VI.2004, GC, pt, 7 ex; 30.VI–16.VII.2004, GC, pt, 33 ex; 16.VII–1.VIII.2004, GC, pt, 4 ex; 1–16.VIII.2004, GC, pt, 1 ex; 16.VIII–8.IX.2004, GC, pt, 1 ex.

OTHER RECORDS. **Nuoro prov.**: Dorgali, Rio Flumineddu, Gola di Gorropu, 350 m, 40.11.04 N 9.29.58 E, 15.VI.2002, BM ME, 1 ex (MHNG).

NOTES. *Drosophila phalerata* is a widespread West Palearctic taxon known as a mushroom species, its larvae feeding from various fungi and the adults usually concentrating around mushroom bodies. It was found sporadically but was not rare in the above Sardinian samples, but the majority of specimens were collected at two localities only. New record for Sardinia.

Drosophila repleta Wollaston, 1858

RECORDS. **C11**: 11.XI.2006, DW, nt, 1 ex. **C82**: 11–12.VI.2004, DB PCe GN MT DW, mt, 1 ex.

OTHER RECORDS. **Cagliari prov.**: "Cagliari, Zavattini" leg., 1 ex (MSNM).

NOTES. This is a warm-adapted domestic species with a worldwide distribution, usually rare in cooler areas outside of fruit stores, stables etc.

Drosophila simulans Sturtevant, 1919

RECORDS. **C06**: 12.XI.2006, DW, nt, 1 ex. **C11**: 7.IX.2006, DA MB DB GN, lt, 1 ex. **C18**: 9.XI.2006, DW, nt, 3 ex. **C31**: 20–23.V.2006, MB DB PCo DW, mt, 1 ex; 12–17.VII.2006, DA MB DB PCe MM DW, mt, 6 ex. **C84**: 3.IX.2003, DW, nt, 1 ex. **S1**: 19.VIII–3.IX.2006, GC, mt, 2 ex; 3–17.X.2006, GC, mt, 7 ex; 17–31.X.2006, GC, mt, 4 ex. **S2**: 11–25.VII.2006, GC, mt, 1 ex; 5–19.IX.2006, GC, mt, 1 ex; 19.IX–3.X.2006, GC, mt, 2 ex; 17–31.X.2006, GC, mt, 2 ex. **S3**: 18.IV–2.V.2006, GC, mt, 1 ex; 2–16.V.2006, GC, mt, 1 ex; 11–25.VII.2006, GC, mt, 1 ex; 25.VII–8.VIII.2006, GC, mt, 1 ex; 3–17.X.2006, GC, mt, 1

ex; 17–31.X.2006, GC, mt, 1 ex. **SARI**: 1–5.IX.2004, GC, wt, 2 ex; 22.XI–17.XII.2004, GC, pt, 2 ex; 17.XII.2004–4.I.2005, GC, pt, 1 ex.

OTHER RECORDS. **A06**: 11.XI.2006, DW, nt, 1 ex. **Nuoro prov.**: "Cala [di] Gonone, 8.X.1980", 1 ex (TCUB).

NOTES. *Drosophila simulans*, closely related to *D. melanogaster*, is another domestic species with a worldwide distribution. It seems that it is better adapted to warmer areas than the latter species, and its dispersal recorded in the second half of the 20th century has reached more northern areas.

Drosophila subobscura Collin, 1936

RECORDS. **C01**: 7.VI.2004, DB PCe GN MT DW, cn, 1 ex; 9.VI.2004, DB PCe GN MT DW, cn, 1 ex. **C11**: 11.XI.2006, DW, nt, 2 ex. **C17**: wdc, DW, nt, 2 ex. **C23**: 19–24.V.2006, MB DB PCo DW, pt, 84 ex. **C31**: 20–23.V.2006, MB DB PCo DW, mt, 30 ex; 12–17.VII.2006, DA MB DB PCe MM DW, mt, 615 ex. **C59**: 10.XI.2006, DW, nt, 1 ex. **C82**: 11–12.VI.2004, DB PCe GN MT DW, mt, 2136 ex; 12.VI.2004, DB PCe GN MT DW, mt, 106 ex. **C85**: 3–4.IX.2003, DB PCe EM MT DW, mt, 1 ex; 22–25.IX.2004, DB PCe EG FM DW, mt, 1 ex. **S1**: 21.III–4.IV.2006, GC, mt, 2 ex; 4–18.IV.2006, GC, mt, 7 ex; 18.IV–2.V.2006, GC, mt, 8 ex; 2–16.V.2006, GC, mt, 10 ex; 16–30.V.2006, GC, mt, 4 ex; 30.V–13.VI.2006, GC, mt, 3 ex; 13–27.VI.2006, GC, mt, 6 ex; 11–25.VII.2006, GC, mt, 6 ex. **S2**: 21.III–4.IV.2006, GC, mt, 7 ex; 18.IV–2.V.2006, GC, mt, 3 ex; 2–16.V.2006, GC, mt, 1 ex; 16–30.V.2006, GC, mt, 3 ex; 30.V–13.VI.2006, GC, mt, 5 ex; 13–27.VI.2006, GC, mt, 14 ex; 27.VI–11.VII.2006, GC, mt, 7 ex; 11–25.VII.2006, GC, mt, 3 ex; 25.VII–8.VIII.2006, GC, mt, 3 ex; 17–31.X.2006, GC, mt, 6 ex. **S3**: 21.III–4.IV.2006, GC, mt, 2 ex; 4–18.IV.2006, GC, mt, 3 ex; 18.IV–2.V.2006, GC, mt, 7 ex; 2–16.V.2006, GC, mt, 5 ex; 16–30.V.2006, GC, mt, 3 ex; 27.VI–11.VII.2006, GC, mt, 3 ex; 11–25.VII.2006, GC, mt, 27 ex; 25.VII–8.VIII.2006, GC, mt, 1 ex; 17–31.X.2006, GC, mt, 1 ex; 24.III–24.V.2006, MB DB PCo DW, wt, 1 ex; 24.III–24.V.2006, MB DB PCo DW, pt, 23 ex. **SARI**: 15–30.VI.2004, GC, pt, 148 ex; 30.VI–16.VII.2004, GC, pt, 698 ex; 16.VII–1.VIII.2004, GC, pt, 97 ex; 1–16.VIII.2004, GC, pt, 92 ex; 16.VIII–8.IX.2004, GC, pt, 23 ex; 8–21.IX.2004, GC, pt, 3 ex; 5.VIII–13.IX.2005, GC, pt, 44 ex; 13–30.IX.2005, GC, pt, 7 ex; 30.IX–17.X.2005, GC, pt, 2 ex; 17.X–3.XI.2005, GC, wt, 1 ex; 11.XI–2.XII.2005, GC, pt, 1 ex. **Medio Campidano prov.**: Villacidro, Nuxeddu mounts, Montimannu Forest, 600 m, 12.VI.2002, 39.24.38 N, 8.37.47 E, BM ME, 1 ex (MHNG).

OTHER RECORDS. **Nuoro prov.**: "Cala [di] Gonone, 8.X.1980", 1 ex (TCUB); Dorgali, Rio Flumineddu, Gola di Gorropu, 350 m, 40.11.04 N, 9.29.58 E, 15.VI.2002, BM ME, 1 ex (MHNG).

Oristano prov.: Cuglieri, Monte Feru, La Madonnina, 800 m, 40.09.29 N, 8.37.44 E, 21.VI.2002, BM ME, 1 ex (MHNG).

NOTES. *Drosophila subobscura* is generally the most widespread and usually dominant species in many natural habitats, but it has been found, as a vagile species, also in some domestic habitats. Like *D. ambigua*, it was introduced into certain areas of the New World. Within its distribution area, many studies of its polymorphism in natural populations have been undertaken, including populations from Alghero and Foresta di Burgos (Sassari prov.), and Monte dei Sette Fratelli and Tasonis (Cagliari prov.) in Sardinia (Richter & Hündler 1955; Prevosti et al. 1975, 1984). During this project, more than 4,000 specimens were collected at various localities, in some cases in very large numbers.

Hirtodrosophila cameraria (Haliday, 1833)

RECORDS. **C23**: 19–24.V.2006, MB DB PCo DW, mt, 4 ex. **C31**: 12–17.VII.2006, DA MB DB PCe MM DW, mt, 1 ex. **C60**: 10.XI.2006, DW, nt, 1 ex. **C77**: 9.VI.2004, DB PCe GN MT DW, cn, 2 ex. **C82**: 11–12.VI.2004, DB PCe GN MT DW, mt, 1245 ex; 12.VI.2004, DB PCe GN MT DW, mt, 4 ex. **S1**: 21.III–4.IV.2006, GC, mt, 1 ex; 4–18.IV.2006, GC, mt, 1 ex; 18.IV–2.V.2006, GC, mt, 1 ex; 2–16.V.2006, GC, mt, 1 ex; 27.VI–11.VII.2006, GC, mt, 1 ex. **S2**: 21.III–4.IV.2006, GC, mt, 1 ex; 4–18.IV.2006, GC, mt, 2 ex; 18.IV–2.V.2006, GC, mt, 3 ex; 8–22.VIII.2006, GC, mt, 2 ex. **S3**: 21.III–4.IV.2006, GC, mt, 1 ex; 4–18.IV.2006, GC, mt, 9 ex; 18.IV–2.V.2006, GC, mt, 13 ex; 2–16.V.2006, GC, mt, 7 ex; 16–30.V.2006, GC, mt, 4 ex; 24.III–24.V.2006, MB DB PCo DW, pt, 2 ex. **SARI**: 15–30.VI.2004, GC, pt, 1 ex; 30.VI–16.VII.2004, GC, pt, 31 ex; 2–16.XII.2004, GC, pt, 2 ex; 16.XII.2005–3.I.2006, GC, pt, 2 ex.

NOTES. *Hirtodrosophila cameraria*, here recorded for the first time from Sardinia, is widespread in the western Palaearctic and is known to be a mushroom feeder, particularly common in the fungal guild in warmer areas (Shorrocks 1977). As shown above, it was recorded sporadically at many localities within the study area, but one collection contained more than 90% of all specimens. In general, females were more common.

Leucophenga maculata (Dufour, 1839)

RECORDS. **S1**: 21.III–4.IV.2004, GC, mt, 1 ex; 4–18.IV.2006, GC, mt, 4 ex; 18.IV–2.V.2006, GC, mt, 2 ex; 2–16.V.2006, GC, mt, 2 ex; 16–30.V.2006, GC, mt, 1 ex; 13–27.VI.2006, GC, mt, 2 ex. **S2**: 21.III–4.IV.2006, GC, mt, 1 ex; 19.IX–3.X.2006, GC, mt, 1 ex; 17–31.X.2006, GC, mt, 1 ex. **SARI**: 1–5.IX.2003, GC, wt, 1 ex; 16.VI–14.VII.2005, GC, mt, 1 ex.

NOTES. *Leucophenga maculata*, recorded here for the first time from Sardinia, has a wide Palaearctic distribution and is known as a mushroom feeder. It is, with 4–5 mm of body length, the largest drosophilid species found during this project. Males show a conspicuous silvery pattern when seen from a certain angle, but all specimens mentioned above are females.

Lordiphosa andalusiaca (Strobl, 1906)

RECORDS. **C31**: 20–23.V.2006, MB DB PCo DW, mt, 12 ex; 23.V.2006, DW, nt, 2 ex. **C70**: 6.VI.2004, DB GN PCe MT DW, cn, 1 ex; 7.VI.2004, DB GN PCe MT DW, cn, 2 ex; 8.VI.2004, DB GN PCe MT DW, cn, 8 ex; 9.VI.2004, DB GN PCe MT DW, cn, 3 ex. **C82**: 11–12.VI.2004, DB PCe GN MT DW, mt, 6 ex. **S1**: 4–18.IV.2006, GC, mt, 3 ex; 16–30.V.2006, GC, mt, 1 ex. **S2**: 4–18.IV.2006, GC, mt, 9 ex; 18.IV–2.V.2006, GC, mt, 1 ex; 2–16.V.2006, GC, mt, 2 ex; 16–30.V.2006, GC, mt, 1 ex; 30.V–13.VI.2006, GC, mt, 1 ex; 27.VI–11.VII.2006, GC, mt, 1 ex. **S3**: 8.IV.2004, GN, nt, 2 ex. **SARI**: 16.II–15.VI.2004, GC, mt, 1 ex.

OTHER RECORDS. **Nuoro prov.**: Dorgali, Rio Flumineddu, Gola di Gorropu, 350 m, 40.11.04 N 9.29.58 E, 15.VI.2002, BM ME, 1 ex (MHNG).

NOTES. *Lordiphosa andalusiaca* is widespread in the western Palaearctic and common in the grass layer; its larvae live in decaying plant matter.

Scaptodrosophila rufifrons (Loew, 1873)

RECORDS. **C14**: V.2006, MB DB PCo DW, mt, 1 ex. **C82**: 11–12.VI.2004, DB PCe GN MT DW, mt, 1 ex.

NOTES. This is the first record of *S. rufifrons* for Sardinia. As far as is known, its larvae inhabit slime fluxes of trees. This is generally a rare and localized species.

Scaptomyza graminum (Fallén, 1823)

RECORDS. **C01**: 22.IX.2004, DW, nt, 2 ex. **C31**: 20–23.V.2006, MB DB PCo DW, mt, 3 ex. **C77**: 7.VI.2004, DB PCe GN MT DW, cn, 2 ex; 9.VI.2004, DB PCe GN MT DW, cn, 9 ex; 23.IX.2004, DW, nt, 3 ex. **C82**: 11–12.VI.2004, DB PCe GN MT DW, mt, 1 ex. **S1**: 4–18.IV.2006, GC, mt, 1 ex; 18.IV–2.V.2006, GC, mt, 3 ex; 3–17.X.2006, GC, mt, 1 ex. **S3**: 21.III–4.IV.2006, GC, mt, 1 ex; 2–16.V.2006, GC, mt, 3 ex; 16–30.V.2006, GC, mt, 1 ex; 18.IV–2.V.2006, GC, mt, 4 ex.

NOTES. *Scaptomyza graminum* has a worldwide distribution and is usually common in the herbaceous layer. Larvae are miners in various plant species,

whereas adults are usually collected by sweep net in the grass layer. The few specimens collected during this study can be explained by the principal use of Malaise traps.

Scaptomyza pallida (Zetterstedt, 1847)

RECORDS. **C01**: 23.IX.2004, DW, nt, 3 ex. **C18**: 9.XI.2006, DA, nt, 8 ex. **C23**: 19–24.V.2006, MB DB PCo DW, mt, 3 ex. **C26**: 15.VII.2006, DW, nt, 1 ex. **C31**: 22.III.2006, DW, nt, 1 ex; 20–23.V.2006, MB DB PCo DW, mt, 177 ex; 23.V.2006, DW, nt, 9 ex; 12–17.VII.2006, DA MB DB PCe MM DW, mt, 15 ex; 12.VII.2006, DW, nt, 1 ex; 12.XI.2006, DW, nt, 35 ex. **C44**: 15.IX.2006, GN, nt, 1 ex. **C60**: 22.IX.2006, DA, nt, 3 ex; 10.XI.2006, DW, nt, 2 ex. **C64**: 11.XI.2006, DW, nt, 65 ex. **C66**: 11.XI.2006, DW, nt, 1 ex. **C70**: 8.VI.2004, DB PCe GN MT DW, cn, 2 ex. **C82**: 22–25.IX.2004, DB PCe FM EG DW, mt, 4 ex. **S1**: 21.III–4.IV.2006, GC, mt, 4 ex; 4–18.IV.2006, GC, mt, 9 ex; 18.IV–2.V.2006, GC, mt, 20 ex; 16–30.V.2006, GC, mt, 5 ex; 3–17.X.2006, GC, mt, 4 ex; 30.V–13.VI.2006, GC, mt, 1 ex; 8–22.VIII.2006, GC, mt, 1 ex; 22.VIII–5.IX.2006, GC, mt, 1 ex; 5–19.IX.2006, GC, mt, 1 ex; 19.IX–3.X.2006, GC, mt, 3 ex; 3–17.X.2006, GC, mt, 4 ex; 17–31.X.2006, GC, mt, 1 ex. **S2**: 21.III–4.IV.2006, GC, mt, 71 ex; 4–18.IV.2006, GC, mt, 60 ex; 18.IV–2.V.2006, GC, mt, 12 ex; 2–16.V.2006, GC, mt, 7 ex; 16–30.V.2006, GC, mt, 11 ex; 5–19.IX.2006, GC, mt, 1 ex; 19.IX–3.X.2006, GC, mt, 6 ex; 3–17.X.2006, GC, mt, 5 ex; 17–31.X.2006, GC, mt, 7 ex. **S3**: 11–25.VII.2006, GC, mt, 2 ex; 17–31.X.2006 GC, mt, 6 ex; 18.IV–2.V.2006, GC, mt, 13 ex; 21.III–4.IV.2006, GC, mt, 15 ex; 4–18.IV.2006, GC, mt, 11 ex; 18.IV–2.V.2006, GC, mt, 1 ex; 2–16.V.2006, GC, mt, 5 ex; 16–30.V.2006, GC, mt, 4 ex; 19.IX–3.X.2006, GC, mt, 3 ex; 10.XI.2006, DW, nt, 8 ex; 24.III–24.V.2006, MB DB PCo DW, pt, 1 ex. **SARI**: 16.II–15.VI.2004, GC, mt, 4 ex; 4–18.I.2005, GC, mt, 1 ex; 2–16.XII.2005, GC, mt, 1 ex.

OTHER RECORDS. **G14**: 13.XI.2006, DW, nt, 1 ex. **Nuoro prov.**: "Cala [di] Gonone, 8.X.1980", 1 ex (TCUB); Dorgali, Rio Flumineddu, Gola di Gorropu, 350 m, 40.11.04 N, 9.29.58 E, 15.VI.2002, BM ME, 1 ex (MHNG).

NOTES. *Scaptomyza pallida* is the most common drosophilid species in the grass layer, with a worldwide distribution. Sporadically, it is found outside of its habitat and sometimes can be collected in large numbers (see C31 and C64 mentioned above). In total, it was the second most common species recorded during this survey. I have identified additional Sardinian specimens (see Other records).

The majority of drosophilid species are attracted by certain baits, and usually fermenting fruits are used for collecting. Within this project, only passive collec-

tion methods (Malaise traps, pitfall traps, and some sweep netting) were applied. Except for the dominant *D. subobscura*, one can suppose that the relative abundance of the species would be different, as compared with baiting results (e.g., Argemí et al. 1999).

In the Checklist of the Italian fauna (Bächli et al. 1995), some species were provisionally entered (with question marks) for Sardinia. Among them the presence of *Drosophila ambigua*, *D. buzzatii*, *D. funebris*, *D. immigrans*, *D. simulans*, *Hirtodrosophila cameraria*, and *Lordiphosa andalusiaca* can now be corroborated. On the other hand, some additional species could have been expected within such an extensive study, e.g. certain *Amiota* Loew, 1862, *Phortica* Schiner, 1862 and *Stegana* Meigen, 1830 species.

REFERENCES

- Argemí M., Monclús M., Mestres F. & Serra L., 1999. Comparative analysis of a community of Drosophilids (Drosophilidae; Diptera) sampled in two periods widely separated in time. *Journal of zoological Systematics and evolutionary Research*, 37: 203–210.
- Ashburner M., Golic K.G. & Hawley R.S., 2005. *Drosophila*. A laboratory handbook. Second edition. Cold Spring Harbor Laboratory Press, 1409 pp.
- Bächli G., 2009. TaxoDros. The database on Taxonomy of Drosophilidae, available at <http://www.taxodros.uzh.ch> [accessed October 2009].
- Bächli G., Canzoneri S. & Papp L., 1995. Diptera Ephydroidea, pp. 1–10. In: Minelli A., Ruffo S. & La Posta S. (eds), Checklist delle specie della fauna italiana, 76. Calderini, Bologna.
- Bächli G., Vilela C.R., Andersson Escher S. & Saura A., 2004. Fauna Entomologica Scandinavica, 39. The Drosophilidae (Diptera) of Fennoscandia and Denmark. Brill, Leiden, 362 pp.
- Brake I. & Bächli G., 2008. Drosophilidae (Diptera). *World Catalogue of Insects*, vol. 7. Apollo Books, Stenstrup, 412 pp.
- Carton Y., 1984. Analyse expérimentale de trois niveaux d'interactions entre *Drosophila melanogaster* et le parasite *Leptopilina bouvardi* (sympatrie, allopatrie, xénopatrie). *Génétique, Sélection, Evolution*, 16: 417–430.
- Cerretti P., Mason F., Minelli A., Nardi G. & Whitmore D., 2009. Foreword, pp. 5–7. In: Cerretti P., Mason F., Minelli A., Nardi G. & Whitmore D. (eds), Research on the Terrestrial Arthropods of Sardinia. *Zootaxa*, 2318.
- Cicchetti R., Argentin G. & Nicoletti B., 1990. The segregation distortion (SD) phenomenon in wild populations of *Drosophila melanogaster*: interaction between chromosomes 3 and SD chromosomes 2. *Genetica*, 81: 77–84.
- Ferrari P., 1987. A guide to the breeding habits and immature stages of Diptera Cyclorhapha. *Entomonograph*, 8 (1–2): 1–907.
- Halfer C., 1981. Interstrain heterochromatin polymorphisms in *Drosophila melanogaster*. *Chromosoma*, 84: 195–206.
- Krause A.H., 1910. Zur Insektenfauna Sardiniens. Faunistische, systematische, biologische und literarische Notizen. *Entomologische Rundschau*, 27: 153–154.
- Krause A.H., 1914. Entomologische Notizen. (Form., Col., Orth., Dipt., Isopt., Lep., Emb.). *Archiv für Naturgeschichte*, Abt. A, 80 (2): 96–104.
- Mason F., Cerretti P., Nardi G., Whitmore D., Birtele D., Hardersen S. & Gatti E., 2006. Aspects of biological diversity in the CONECOFOR plots. IV. The Invertebrate Biodiv pilot project, pp. 51–70. In: Ferretti M., Petriccione B., Bussotti F. & Fabbio G. (eds), Aspects of biodiversity in selected forest ecosystems in Italy: status and changes over the period 1996–2003. Third report of the Task Force on Integrated and Combined (I&C) evaluation of the CONECOFOR programme. *Annali dell'Istituto sperimentale per la Selvicoltura*, 30, Supplemento 2.
- Pomini F.P., 1940. Contributi alla conoscenza delle *Drosophila* (Diptera Acalyptera) europee. I. Descrizione di alcune specie riferibili al gruppo *obscura*. *Bollettino dell'Istituto di Entomologia dell'Università degli Studi di Bologna*, 12: 145–164.
- Prevosti A., de Frutos R., Alonso G., Latorre A., Monclús M. & Martínez M.-J., 1984. Genetic differentiation between natural populations of *Drosophila subobscura* in the Western Mediterranean Area with respect to chromosomal variation. *Génétique, Sélection, Evolution*, 16: 143–156.
- Prevosti A., Ocaña J. & Alonso G., 1975. Distances between populations of *Drosophila subobscura*, based on chromosome arrangement frequencies. *Theoretical and Applied Genetics*, 45: 231–241.
- Richter H. & Hündler M., 1955. Die geographische Verbreitung der chromosomalen Strukturtypen von *Drosophila subobscura* Coll. *Zeitschrift für induktive Abstammungs- und Vererbungslehre*, 87: 85–92.
- Ruiz A., Naveira H. & Fontdevila A., 1984. La historia evolutiva de "*Drosophila buzzatii*". IV. Aspectos citogenéticos de su polimorfismo cromosómico. *Genética ibérica*, 36: 13–35.
- Shorrocks B., 1977. An ecological classification of European *Drosophila* species. *Oecologia*, 26: 335–345.

15. Diptera, LIMONIIDAE

Sigita PODENAS

Nature Research Centre, Akademijos st. 2, LT-08412 Vilnius, Lithuania. E-mail: sigita.podenas@gf.vu.lt

Short palped crane flies (Limoniidae) are the largest family of crane flies with 10,833 described species (Oosterbroek 2011). They are distributed worldwide (except Antarctica), with an extensive fossil record dating to the late Triassic (Krzeminski 1992).