

Contribution to the knowledge of the Coccinellidae of Sardinia (Coleoptera)*

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ABSTRACT

An updated checklist of the Coccinellidae of Sardinia (Italy) is provided. Sixty-two species are recorded with certainty, while 19 other species (*Scymnus (Mimopullus) fulvicollis* (Mulsant, 1846), *S. (M.) pharaonis* Motschulsky, 1851, *S. (Neopullus) haemorrhoidalis* (Herbst, 1797), *S. (N.) limbatus limbatus* (Stephens, 1831), *Nephus (Nephus) reunioni* Fürsch, 1974, *Scymniscus tristiculus* (Weise, 1929), *Hyperaspis chevrolati* Canepari, 1985, *H. concolor* Suffrian, 1843, *H. hoffmannseggii* (Gravenhorst, 1807), *H. reppensis reppensis* (Herbst, 1783), *Coccidula rufa* (Herbst, 1783), *Coccinella (Coccinella) magnifica* Redtenbacher, 1843, *Tytthaspis phalerata* (A. Costa, 1849), *Oenopia lyncea agnata* (Rosenhauser, 1847), *Halyzia sedecimguttata* (Linnaeus, 1758), *Myrrha octodecimguttata octodecimguttata* (Linnaeus, 1758), *Calvia decemguttata* (Linnaeus, 1758), *Chilocorus similis* (Rossi, 1790) and *Exochomus nigromaculatus* (Goeze, 1777)) are excluded from the Sardinian fauna.

Key words: Coccinellidae, Sardinia, faunistics, new records, checklist.

RIASSUNTO

Contributo alla conoscenza dei Coccinellidae della Sardegna (Coleoptera)

L'autore fornisce una lista aggiornata dei Coccinellidae di Sardegna; complessivamente sono segnalate con certezza 62 specie, mentre altre 19 specie (*Scymnus (Mimopullus) fulvicollis* (Mulsant, 1846), *S. (M.) pharaonis* Motschulsky, 1851, *S. (Neopullus) haemorrhoidalis* (Herbst, 1797), *S. (N.) limbatus limbatus* (Stephens, 1831), *Nephus (Nephus) reunioni* Fürsch, 1974, *Scymniscus tristiculus* (Weise, 1929), *Hyperaspis chevrolati* Canepari, 1985, *H. concolor* Suffrian, 1843, *H. hoffmannseggii* (Gravenhorst, 1807), *H. reppensis reppensis* (Herbst, 1783), *Coccidula rufa* (Herbst, 1783), *Coccinella (Coccinella) magnifica* Redtenbacher, 1843, *Tytthaspis phalerata* (A. Costa, 1849), *Oenopia lyncea agnata* (Rosenhauser, 1847), *Halyzia sedecimguttata* (Linnaeus, 1758), *Myrrha octodecimguttata octodecimguttata* (Linnaeus, 1758), *Calvia decemguttata* (Linnaeus, 1758), *Chilocorus similis* (Rossi, 1790) ed *Exochomus nigromaculatus* (Goeze, 1777)) sono escluse dalla fauna sarda.

INTRODUCTION

Coccinellidae are Coleoptera well known for their prettiness and utility. They belong to the superfamily Cucujoidea and are a large family with about 6,000 species described worldwide (Iablokoff-Khnzorian 1982; Vandenberg 2002), but many others, especially in subfamilies Sticholotidinae and Scymninae of the tropical regions, are still to be discovered. One hundred and thirty species occur in Italy including Sardinia, Sicily and minor islands (Audisio et al. 1995; Canepari 2003, 2004, 2009). The goal of this paper is to provide an updated commented checklist of the Sardinian species.

MATERIAL AND METHODS

This study is based on material collected by the Centro Nazionale per lo Studio e la Conservazione Biodiversità Forestale "Bosco Fontana" of Verona (Italy) (CNBFVR) (cf. Mason et al. 2006; Cerretti et al. 2009; Bardiani 2011) and on that from various collections examined by the author.

Information about ecology and geographic distribution of species comes from Iablokoff-Khnzorian (1982), Canepari (2004) and Kovář (2007) and the author's personal observations and/or collection. The systematics used follow Kovář (2007) and Canepari (2004, 2009).

The localities of collection are listed alphabetically according to the new administrative provinces (cf. Bardiani 2011), also when on the original labels the previous arrangement is reported. A semicolon separates different records; if these are from the same site, the name of the site is listed only at the beginning of the oldest record. The genera are listed, unless otherwise stated, according to Kovář (2007), and all species are listed alphabetically.

The geographic coordinates of the sites sampled by CNBFVR are listed by Bardiani (2011).

Unfortunately, the full label data of specimens from some collections (CFF, MCC, MCSG, MCSV) are not listed since they were not annotated after the determination of these specimens.

ABBREVIATIONS

COLLECTORS. AFo = A. Focarile; AFr = A. Franzini; AM = A. Campanaro; AS = A. Susini; CC = C. Canepari; CL = C. Leonardi; DA = D. Avesani; DB = D. Birtele; DW = D. Whitmore; EG = E. Gatti; FA = F. Angelini; FM = F. Mason; GC = G. Chessa; GL = G. Liberti; GN = G. Nardi; GS = G. Scaglioni; LC = L. Ceresa; LF = L. Fanello; L? = no collector; MA = M. Armeni; MB = M. Bardiani; MM = M. Mei; MP = M. Pavesi; MT = M. Tisato; MTr = M. Trizzino; PCe = P. Cerretti; PCo = P. Cornacchia; PL = P. Leo; RC = R. Caldara; RP = R. Poggi; RR = R. Regalin; SF = S. Ferro; SRi = S. Riese; UL = U. Lostia; VB = V. Bazzoni; VR = V. Rosa; VV = V. Vomero.

COLLECTING METHODS. dc = direct collecting; lt = light trap; mt = Malaise traps; nt = entomological net; oe = entomological umbrella; sn = sweep net; wt = window flight trap.

DEPOSITORIES. ACF = F. Angelini (Francavilla Fontana, Brindisi); CFF = A. Focarile (Faedo, Switzerland); CCSD = C. Canepari (San Donato Milanese, Milan); CNBFVR = Centro Nazionale per lo Studio e la Conservazione della Biodiversità Forestale "Bosco Fontana" di Verona (Marmirolo, Mantua); CPC = P. Cornacchia (Porto Mantovano, Mantua); MCC = C. Meloni c/o Museo Civico di Storia Naturale "G. Doria" (Genoa); EISS = Istituto di Entomologia Agraria dell'Università di Sassari (Sassari); MCSG = Museo Civico di Storia Naturale "G. Doria" (Genoa); MCSV = Museo Civico di Storia Naturale di Verona (Verona); MCZR = Museo Civico di Zoologia di Roma (Rome); MRST = Museo Regionale di Storia Naturale (Turin); PGC = R. Poggi (Genoa).

OTHER ABBREVIATIONS AND RECURRENT TERMS USED IN FAUNISTIC LIST. abbeveratoio = drinking trough; canale = canal; det.? = doubtful determination; dint. = surroundings of; di Stato = Statal; dune = dunes; ex = specimen/s; foce = river mouth; Foresta = Forest; greto del = river-bed of; grotta = cave; Isola = Island; Lago = Lake; loc. = locality; Monte = Mount; M.ti = Mounts; pendici = slopes; P.ta = Peak; radura = clearing; rad. strada = clearing alongside the road; Rio = stream; riva sinistra = left bank; Saline = Saltworks; sorg. = spring; spiaggia = beach; stagno = pond;

strada = road; strada per = road to; Strada Statale = State Road; su Rio = above Rio; Torrente = Torrent; Valle = Valley; wdc = without date of collection.

FAUNISTIC LIST

1. *Coelopterus salinus* Mulsant, 1852

MATERIAL EXAMINED. **Cagliari prov.:** Cagliari, Saline di Stato, 14.IV.1990, CM, on *Thymelaea irsuta*, 40 ex (CCSD); Monserrato, VI.1998, LF, 5 ex (CCSD). **Nuoro prov.:** East of Monte Novo S. Giovanni, Foresta Demaniale Montes, 1000 m, 3.V.1983, RP, on *Genista corsica*, 1 ex (CCSD).

DISTRIBUTION. Iberian Peninsula, Mediterranean France, Sardinia, Iran, North and tropical Africa.

NOTES. Occurs chiefly in *Salicornia* habitats periodically inundated by sea water (Canepari 2010). It is the only representative in Italy of the subfamily Sticholotidinae.

2. *Stethorus (Stethorus) gilvifrons* (Mulsant, 1850)

MATERIAL EXAMINED. **Carbonia-Iglesias prov.:** Domusnovas, sa Duchessa, 371 m, 2–16.V.2006, GC, mt, 1 ex (det.?) (CNBFVR); 30.V–13.VI.2006, GC, mt, 2 ex (CNBFVR); 13–27.VI.2006, GC, mt, 1 ex (CNBFVR); 27.VI–11.VII.2006, GC, mt, 1 ex (CNBFVR). **Iglesias, dint. colonia Beneck, 636 m, 16–30.V.2006, GC, mt, 1 ex (CNBFVR).**

DISTRIBUTION. Mediterranean Region, Middle East, Saudi Arabia, Pakistan, Kashmir, India (Baluchistan, Punjab, Lyallpur) and Oriental Region.

NOTES. This species, like most members of the genus, is a predator of mites of the family Tetranychidae.

3. *Stethorus (Stethorus) pusillus* (Herbst, 1797)

= *Stethorus punctillum* (Weise, 1891)

MATERIAL EXAMINED. **Cagliari prov.:** Cagliari, CM, 4 ex (MCC); Campu Omu, VI.1955, LC, 1 ex (CCSD); Capoterra, Rio S. Lucia, CM, 1 ex (MCC); S. Priamo, Rio Sa Picocca, CM, 2 ex (MCC). **Carbonia-Iglesias prov.:** Domusnovas, sa Duchessa, 371 m, 4–18.IV.2006, GC, mt, 3 ex (CNBFVR); 18.IV–2.V.2006, GC, mt, 1 ex (CNBFVR); 16–30.V.2006, GC, mt, 8 ex (CNBFVR); 30.V–13.VI.2006, GC, mt, 3 ex (CNBFVR); 13–27.VI.2006, GC, mt, 4 ex (CNBFVR); 27.VI–11.VII.2006, GC, mt, 2 ex (CNBFVR); 8–22.VIII.2006, GC, mt, 1 ex (CNBFVR); 19.IX–3.X.2006, GC, mt, 1 ex (CNBFVR); Domusnovas, Valle Oridda, 592 m, 16–30.V.2006, GC, mt, 2 ex

(CNBFVR); 13–27.VI.2006, GC, mt, 1 ex (CNBFVR); 11–25.VII.2006, GC, mt, 1 ex (CNBFVR); 8–22.VIII.2006, GC, mt, 2 ex (CNBFVR); Iglesias, dint. colonia Beneck, 636 m, 2–16.V.2006, GC, mt, 2 ex (CNBFVR); 16–30.V.2006, GC, mt, 3 ex (CNBFVR); 30.V–13.VI.2006, GC, mt, 1 ex (CNBFVR); 13–27.VI.2006, GC, mt, 2 ex (CNBFVR); 27.VI–11.VII.2006, GC, mt, 2 ex (CNBFVR); 11–25.VII.2006, GC, mt, 1 ex (CNBFVR). **Nuoro prov.:** Gadoni, CM, 2 ex (MCC). **Ogliastra prov.:** Seui, dint. Monte Tonneri, 825 m, 17–20.V.2008, PA MB GN MTi, mt, 1 ex (CNBFVR); Villagrande Strisaili, dint. Lago Alto del Flumendosa, strada per Perda Liana, 814 m, 16.V.2008, GN PA MB MTi, dc, 1 ex (CNBFVR). **Sassari prov.:** Ossi, 21.VII.1974, L?, 1 ex (EISS).

DISTRIBUTION. Europe, northern Asia (as far as Sakhalin), Korea, North Africa and North America (imported).

NOTES. Species very common in broad-leaved forests on many deciduous trees, in meadows, fields and orchards.

4. *Scymnus (Mimopullus) marinus* (Mulsant, 1850)

= *Scymnus mediterraneus* Iablokoff-Khnzorian, 1972

= *Scymnus pallidivestis* Mulsant, 1853

MATERIAL EXAMINED. **Cagliari prov.:** Quartu Sant'Elena, Geremeas, CM, 3 ex (MCC); Villasimius, 27.IX.1983, CC, 29 ex (CCSD). **Carbonia-Iglesias prov.:** Domusnovas, sa Duchessa, 371 m, 2–16.V.2006, GC, mt, 1 ex (CNBFVR); 16–30.V.2006, GC, mt, 1 ex (CNBFVR); 13–27.VI.2006, GC, mt, 1 ex (CNBFVR); 5–19.IX.2006, GC, mt, 1 ex (CNBFVR); Domusnovas, Valle Oridda, 592 m, 16–30.V.2006, GC, mt, 1 ex (CNBFVR); 30.V–13.VI.2006, GC, mt, 2 ex (CNBFVR); 13–27.VI.2006, GC, mt, 1 ex (CNBFVR); 27.VI–11.VII.2006, GC, mt, 5 ex (CNBFVR); 11–25.VII.2006, GC, mt, 6 ex (CNBFVR); Fluminimaggiore, Passo Bidderdi, 16.V.1995, FA, 10 ex (ACF); Iglesias, dint. colonia Beneck, 636 m, 18.IV–2.V.2006, GC, mt, 1 ex (CNBFVR); 2–16.V.2006, GC, mt, 2 ex (CNBFVR); 13–27.VI.2006, GC, mt, 1 ex (CNBFVR); 27.VI–11.VII.2006, GC, mt, 5 ex (CNBFVR); 11–25.VII.2006, GC, mt, 3 ex (CNBFVR); 19.IX–3.X.2006, GC, mt, 3 ex (CNBFVR); 17–31.X.2006, GC, mt, 1 ex (CNBFVR); Iglesias, Marganai, plot CONECOFOR SAR1, 700 m, 16.II–15.VI.2004, DB PCe GN DW, mt, 3 ex (CNBFVR). **Ogliastra prov.:** Gairo, dint. Monte Perda Liana, 1060 m, 16.V.2008, GN PA MB MTi, sn, 1 ex (CNBFVR). **Olbia-Tempio prov.:** Santa Teresa di Gallura, Capo Testa, 11.VIII.1959, L?, 1 ex (CCSD). **Nuoro prov.:** Fonni, Lago Gusana, 7.V.1995, FA, 8 ex (ACF); dint. Oliena, 6.V.1995, FA, 6 ex (ACF); dint. Orgosolo, 6.V.1995, FA, 2 ex (ACF); strada Laconi–Aritzo, 600 m, 10.V.1995, FA, 1 ex (ACF). **Sassari prov.:** Alghero, CM, 5 ex (MCC).

DISTRIBUTION. Mediterranean regions of Europe, Africa and the Middle East.

NOTES. Common and eurytopic on trees, shrubs and grasses.

5. *Scymnus (Pullus) auritus* (Thunberg, 1795)

MATERIAL EXAMINED. **Carbonia-Iglesias prov.:** Fluminimaggiore, Passo Bidderdi, 16.V.1995, FA, 1 ex (ACF). **Nuoro prov.:** Baronia, Siniscola, Capo Comino, spiaggia, 14–19.VI.2007, PCo, dc, 1 ex (CPC); Catena del Marghine, pendici NE, strada Bolognana–Burgos, 573 m, 22.V.1995, FA, 6 ex (ACF); Fonni, Lago Gusana, 7.V.1995, FA, 1 ex (ACF); dint. Oliena, 6.V.1995, FA, 1 ex (ACF); dint. Orgosolo, 6.V.1995, FA, 1 ex (ACF); Orune, RE, 2 ex (PGC); strada Laconi–Aritzo, 600 m, 10.V.1995, FA, 1 ex (ACF). **Olbia-Tempio prov.:** Monte Limbara, pendici Ovest, 1100–1200 m, 29.V.1995, FA, 1 ex (ACF).

DISTRIBUTION. All of Europe (except extreme north), western and northern Asia, Middle East and Arabia.

NOTES. Species common on grasses, trees and bushes.

6. *Scymnus (Pullus) subvillosus* (Goeze, 1777)

MATERIAL EXAMINED. **Cagliari prov.:** Elmas, CM, 1 ex (MCC); Isola di S. Pietro, Guardia dei Mori, 27.VI.1987, VV, 1 ex (CNBFVR). Monte Sette Fratelli, pendici Nord-Ovest, 13.V.1995, FA, 1 ex (ACF). **Carbonia-Iglesias prov.:** Domusnovas, sa Duchessa, 371 m, 16–30.V.2006, GC, mt, 1 ex (CNBFVR); Domusnovas, P.ta Piloni de Sa Figù, 750 m, 11.IX.2006, GN, nt, 2 ex (CNBFVR); Domusnovas, Sedda Pranu Cardu, 549 m, 20–24.V.2006, MB DB PCo DW, mt, 1 ex (CNBFVR); Domusnovas, Valle Oridda, 592 m, 21.III–4.IV.2006, GC, mt, 1 ex (CNBFVR); 11–25.VII.2006, GC, mt, 4 ex (CNBFVR); Giba, dint. Villarios, abbeveratoio, 5 m, 7.IX.2007, AM, 1 ex (CNBFVR); Iglesias, dint. colonia Beneck, 636 m, 2–16.V.2006, GC, mt, 1 ex (CNBFVR); 27.VI–11.VII.2006, GC, mt, 2 ex (CNBFVR); 11–25.VII.2006, FC, mt, 1 ex (CNBFVR). **Ogliastra prov.:** Gairo, dint. Monte Perda Liana, 1060 m, 16.V.2008, MB PA GN MTi, oe, 1 ex (CNBFVR). **Olbia-Tempio prov.:** Golfo Aranci, 2.V.1995, FA, 1 ex (ACF). **Sassari prov.:** Ossi, 5.VIII.1975, L?, 1 ex (CCSD); Viddalba, Fiume Coghinas, 26.V.1995, FA, 1 ex (ACF).

DISTRIBUTION. All of Europe (except North), North Africa, Middle East, Siberia and the Afrotropical region.

NOTES. Species common on trees and grasses. In the southern regions there is a prevalence of its light forms.

7. *Scymnus (Pullus) suturalis* (Thunberg, 1795)

MATERIAL EXAMINED. **Cagliari prov.:** Cagliari, CM, 6 ex (MCC); Quartu Sant'Elena, Cala Regina, CM, 3 ex (MCC).

DISTRIBUTION. All of Europe, Mediterranean Region, North Asia and North America (imported).

NOTES. A coccidophagous species on Pinaceae. In the Mediterranean Region, a completely yellow form (*testaceicolor* Roubal, 1927), probably an ecological subspecies, is found on *Pinus maritima*.

8. *Scymnus (Scymnus) apetzi* Mulsant, 1846

MATERIAL EXAMINED. **Cagliari prov.:** Cagliari, CM, 5 ex (MCC); Cagliari, Monte Urpinu, CM, 3 ex (MCC); Capitana, CM, 2 ex (MCC); Geremeas, CM, 2 ex (MCC); Quartu Sant'Elena, CM, 3 ex (MCC); Sarrabus, L?, 1 ex (MCSG); Vallermosa, dint. Cant. de s'Acquacotta, 83 m, 19.V.2008, GN PA MB MTr, sn, 1 ex (CNBFVR). **Carbonia-Iglesias prov.:** Gonnese, CM, 5 ex (MCC); Iglesias, 1 ex (MCSG). **Medio Campidano prov.:** Villacidro, CM, 6 ex (MCC); Villacidro, dint. Lago di Montimannu, 256 m, 18.V.2008, GN PA MB MTr, sn, 1 ex (CNBFVR). **Nuoro prov.:** Gennargentu, Bruncu Spina, 1200–1500 m, 4.VII.2004, PCo GS, sn, 3 ex (CPC). **Olbia-Tempio prov.:** dint. Tempio Pausania, 30.V.1995, FA, 2 ex (ACF). **Sassari prov.:** Monte Limbara, 1200 m, 7.VII.2004, PCo GS, sn, 1 ex (CPC).

DISTRIBUTION. Central and southern Europe, Mediterranean Region and western Asia.

NOTES. An aphidophagous species, living on grasses and shrubs. It is the commonest species of the subfamily Scymninae in peninsular Italy, but is not very frequent in Sardinia. *Scymnus (S.) apetzi* is a polymorphic species or maybe a complex of species hardly separable from one another by small differences in the genital apparatus and by the shape of the elytral spot (cf. Canepari 1983). Some of the above-mentioned specimens were already published by Canepari (1983).

9. *Scymnus (Scymnus) bivulnerus* Baudi di Selve, 1894

= *Scymnus bivulnerus* Capra & Fürsch, 1967

MATERIAL EXAMINED. **Cagliari prov.:** Capoterra, CM, 2 ex (MCC); Decimomannu, Rio Flumineddu, CM, 1 ex (MCC); Quartu Sant'Elena, Stagno di Molentargius, CM, 6 ex (MCC); Monte Sette Fratelli, Maidopis, CM, 4 ex (MCC); Pula, CM, 1 ex (MCC); San Vito, 1 ex (MCSG); Villaspeciosa, CM, 3 ex (MCC). **Carbonia-Iglesias prov.:** Domusnovas, sa Duchessa, 371 m, 18.IV–2.V.2006, GC, mt, 4 ex (CNBFVR); 2–16.V.2006, GC, mt, 3 ex (CNBFVR); 16–30.V.2006, GC, mt, 11 ex (CNBFVR); 30.V–13.VI.2006, GC, mt, 6 ex (CNBFVR); 13–27.VI.2006, GC, mt, 13 ex (CNBFVR); 27.VI–11.VII.2006, GC, mt, 2 ex (CNBFVR); 11–25.VII.2006, GC, mt, 1 ex (CNBFVR); 25.VII–8.VIII.2006, FC, mt, 1 ex (CNBFVR); Domusnovas, Lago Siuru, 322 m, 20–23.V.2006,

MB DB PCo DW, mt, 1 ex (CNBFVR); Domusnovas, Valle Oridda, 592 m, 16–30.V.2006, GC, mt, 1 ex (CNBFVR); 11–25.VII.2006, GC, mt, 1 ex (CNBFVR); 22.VIII–5.IX.2006, GC, mt, 3 ex (CNBFVR); 11.XI.2006, GN, sn, 1 ex (CNBFVR); Fluminimaggiore, Passo Bidderdi, 16.V.1995, FA, 2 ex (ACF); Iglesias, dint. colonia Beneck, 636 m, 2–16.V.2006, GC, mt, 3 ex (CNBFVR); 16–30.V.2006, GC, mt, 8 ex (CNBFVR); 30.V–13.VI.2006, GC, mt, 1 ex (CNBFVR); 13–27.VI.2006, GC, mt, 12 ex (CNBFVR); 27.VI–11.VII.2006, GC, mt, 1 ex (CNBFVR); 11–25.VII.2006, GC, mt, 5 ex (CNBFVR); 25.VII–8.VIII.2006, GC, mt, 4 ex (CNBFVR); 8–22.VIII.2006, GC, mt, 6 ex (CNBFVR); 22.VIII–5.IX.2006, GC, mt, 2 ex (CNBFVR); 5–19.IX.2006, GC, mt, 1 ex (CNBFVR); 19.IX–3.X.2006, GC, mt, 7 ex (CNBFVR). **Nuoro prov.:** Baronia, Siniscola, Case Capo Comino 20–29.VI.2007, PCo, 1 ex (CPC); Baronia, Siniscola, Monte Albo, 600–800 m, 11.VII.2000, PCo GS, sn, 1 ex (det.?) (CPC); Catena del Marghine, pendici NE, strada Bolotana–Burgos, 450 m, 22.V.1995, FA, 4 ex (ACF); Fonni, Lago Gusana, 7.V.1995, FA, 1 ex (ACF); Gadoni, CM, 1 ex (MCC); Laconi, CM, 2 ex (MCC); strada Laconi–Aritzo, 600 m, 10.V.1995, FA, 3 ex (ACF); Nuoro, 9 ex (MCSG); dint. Oliena, 6.V.1995, FA, 1 ex (ACF); dint. Orgosolo, 6.V.1995, FA, 1 ex (ACF); Sadali, L?, 3 ex (MCSG); Seui, CM, 4 ex (MCC). **Olbia-Tempio prov.:** Monte Limbara, pendici Ovest, 1100–1200 m, 29.V.1995, FA, 1 ex (ACF). **Oristano prov.:** Oristano, CM, 5 ex (MCC); Oristano, Fiume Tirso, CM, 2 ex (MCC); Oristano, Strada Pontile, CM, 3 ex (MCC). **Sassari prov.:** Gocèano, dint. Bono, 750 m, 24.VI.2007, PCo GS, sn, 1 ex (CPC); Gocèano, Bono, loc. b'Uccaidu, 1040 m, 24.VI.2007, PCo GS, sn, 1 ex (CPC); Gocèano, dint. Bultei, 650 m, 24.VI.2007, PCo GS, sn, 1 ex (CPC); Ossi, 27.VIII.1976, L?, 1 ex (CCSD).

DISTRIBUTION. Mediterranean Region.

NOTES. The holotype of *S. bivulnerus* Capra & Fürsch, 1967 is from Pantelleria Island (Sicily) and has the elytral spot extended (cf. Canepari 1983). The specimens from Sardinia have a roundish elytral spot similar to that of *S. (S.) apetzi* but are distinguished from the latter by yellow legs and morphology of the male genital apparatus. Some of the above-mentioned records were already published by Canepari (1983).

10. *Scymnus (Scymnus) damryi* Weise, 1879

MATERIAL EXAMINED. **Cagliari prov.:** Cagliari, CM, 9 ex (MCC); Campu Omu, CM, 3 ex (MCC); dint. Capoterra, CM, 2 ex (MCC); Elmas, CM, 2 ex (MCC); Geremeas, CM, 2 ex (MCC); Monte Sette Fratelli, CM, 3 ex (MCC); Pula, CM, 5 ex (MCC); Quartu Sant'Elena, CM, 1 ex (MCC); dint. Seulo, 743 m, 17.V.2008, MB PA GN MTr, sn, 1 ex (CNBFVR). **Carbonia-Iglesias prov.:** Domusnovas, Pta Piloni de sa Figù, 750 m, 11.IX.2006, GN, nt, 1 ex (CNBFVR); Domusnovas, sa Duchessa, 371 m, 2–16.V.2006, GC, mt, 2 ex (CNBFVR);

16–30.V.2006, GC, mt, 2 ex (CNBFVR); 13–27.VI.2006, GC, mt, 1 ex (CNBFVR); 8–22.VIII.2006, GC, mt, 2 ex (CNBFVR); 22.VIII–5.IX.2006, FC, mt, 1 ex (CNBFVR); Domusnovas, Valle Oridda, 592 m, 2–16.V.2006, GC, mt, 3 ex (CNBFVR); 16–30.V.2006, GC, mt, 1 ex (CNBFVR); 13–27.VI.2006, GC, mt, 1 ex (CNBFVR); 25.VII–8.VIII.2006, GC, mt, 1 ex (CNBFVR); Iglesias, dint. colonia Beneck, 636 m, 2–16.V.2006, GC, mt, 1 ex (CNBFVR); 13–27.VI.2006, GC, mt, 1 ex (CNBFVR); 11–25.VII.2006, GC, mt, 1 ex (CNBFVR); 25.VII–8.VIII.2006, GC, mt, 2 ex (CNBFVR). **Medio Campidano prov.:** Arbus, Piscinas, 0 m, 14.VII.2006, DA MB DB PCe MM DW, nt, 1 ex (CNBFVR). **Nuoro prov.:** Lodé, S. Anna, 490 m, 15.V.2008, MB PA GN MTr, sn, 1 ex (CNBFVR); Siniscola, Capo Comino, spiaggia, 7–10.VII.2000, PCo GS, 1 ex (CPC); Siniscola, Monte Albo, 4.V.1995, FA, 1 ex (ACF). **Ogliastra prov.:** Gairo, dint. Monte Perda Liana, 1060 m, 16.V.2008, GN PA MB MTr, sn, 1 ex (CNBFVR); Gairo, Monte Perda Liana, 1219 m, 16.V.2008, GN PA MB MTr, dc, 1 ex (CNBFVR); Seui, dint. Monte Tonneri, 919 m, 5.IX.2006, GN, sn, su *Euphorbia* spp., 5 ex (CNBFVR); Seui, dint. Monte Tonneri, Sa ucca 'e su Oe, 912 m, 18.V.2008, MB PA GN MTr, sn, 1 ex (CNBFVR); dint. Talana, 478 m, 15.V.2008, GN PA MB MTr, sn, 2 ex (CNBFVR). **Olbia-Tempio prov.:** Golfo Aranci, 2.V.1995, FA, 3 ex (ACF); Monte Limbara, pendici Nord-Ovest, 1100–1200 m, 29.V.1995, FA, 1 ex (ACF). **Oristano prov.:** Marrubiu, CM, 2 ex (MCC). **Sassari prov.:** Alghero, Isola Piana, 29.VI.1987, VV, 10 ex (MCZR).

DISTRIBUTION. Corsica, Sardinia and Elba Island (Tuscany).

NOTES. This endemic species is not rare in various biotopes.

11. *Scymnus (Scymnus) femoralis* (Gyllenhal, 1827)

DISTRIBUTION. Central and southern Europe (cf. Canepari 2009).

NOTES. Species firstly recorded from Sardinia by Canepari (2009). Its relationship with *S. (S.) interruptus* (Goeze, 1777) needs studying further (cf. Canepari 2009).

12. *Scymnus (Scymnus) interruptus* (Goeze, 1777)

MATERIAL EXAMINED. **Cagliari prov.:** Cagliari, Strada Statale 130, Km 3.200, CM, 2 ex (MCC); Cagliari, Terramaini, CM, 2 ex (MCC).

DISTRIBUTION. Central and southern Europe, North Africa, Middle East and central Asia.

NOTES. Species not common in Sardinia.

13. *Scymnus (Scymnus) laetificus* Weise, 1879

MATERIAL EXAMINED. **Cagliari prov.:** Cagliari, CM, 13 ex (MCC); Cagliari, Stagno di Molentargius, CM, 9 ex (MCC); Cagliari, Terramaini, CM, 4 ex (MCC); Capoterra, CM, 3 ex (MCC); Muravera, Torre Salinas, stagno Saline, 12.V.1995, FA, 1 ex (ACF). **Oristano prov.:** Oristano, CM, 3 ex (MCC).

DISTRIBUTION. Portugal, Spain, Sardinia, Sicily, Morocco, Algeria and Tunisia.

NOTES. This Mediterranean species seems quite sporadic. It was already cited from Sardinia (Cagliari, Assemini) by Fürsch et al. (1967).

14. *Scymnus (Scymnus) marginalis* (Rossi, 1794)

MATERIAL EXAMINED. **Cagliari prov.:** dint. Capoterra, CM, 6 ex (MCC); Chia, CM, 3 ex (MCC); Quartu Sant'Elena, CM, 1 ex (MCC); Monte Sette Fratelli, CM, 2 ex (MCC); San Gregorio, CM, 2 ex (MCC); Stagno di Simbirizzi, CM, 4 ex (MCC). **Carbonia-Iglesias prov.:** Buggerru, Cala Domestica, 10 m, 10.IX.2006, GN, sn, 1 ex (CNBFVR); Domusnovas, Bega d'Aleuni, 621 m, 11.IX.2006, GN, nt, 2 ex (CNBFVR); Domusnovas, sa Duchessa, 371 m, 18.IV–2.V.2006, GC, mt, 3 ex (CNBFVR); 2–16.V.2006, GC, mt, 9 ex (CNBFVR); 16–30.V.2006, GC, mt, 10 ex (CNBFVR); 30.V–13.VI.2006, GC, mt, 1 ex (CNBFVR); 13–27.VI.2006, GC, mt, 3 ex (CNBFVR); 27.VI–11.VII.2006, GC, mt, 1 ex (CNBFVR); 11–25.VII.2006, GC, mt, 1 ex (CNBFVR); 25.VII–8.VIII.2006, FC, mt, 1 ex (CNBFVR); 8–22.VIII.2006, GC, mt, 2 ex (CNBFVR); Domusnovas, dint. Planargia Scoveri, 625 m, 20–24.V.2006, MB, DB, PCo & DW, mt, 1 ex (CNBFVR); Domusnovas, Valle Oridda, 592 m, 2–16.V.2006, GC, mt, 3 ex (CNBFVR); 16–30.V.2006, GC, mt, 13 ex (CNBFVR); 30.V–13.VI.2006, GC, mt, 2 ex (CNBFVR); 13–27.VI.2006, GC, mt, 3 ex (CNBFVR); 27.VI–11.VII.2006, GC, mt, 4 ex (CNBFVR); 11–25.VII.2006, GC, mt, 19 ex (CNBFVR); 25.VII–8.VIII.2006, GC, mt, 1 ex (CNBFVR); 22.VIII–5.IX.2006, GC, mt, 1 ex (CNBFVR); 5–19.IX.2006, GC, mt, 9 ex (CNBFVR); 19.IX–3.X.2006, GC, mt, 2 ex (CNBFVR); 10.XI.2006, MB, dc, 1 ex (CNBFVR); 11.XI.2006, GN, sn, 3 ex (CNBFVR); Fluminese, dint. Arcu Genna Bogai, 400 m, 5.IV.2004, GS SF, sn, 1 ex (CPC); Iglesias, dint. colonia Beneck, 636 m, 21.III–4.IV.2006, GC, mt, 1 ex (CNBFVR); 2–16.V.2006, GC, mt, 2 ex (CNBFVR); 16–30.V.2006, GC, mt, 1 ex (CNBFVR); 30.V–13.VI.2006, GC, mt, 4 ex (CNBFVR); 13–27.VI.2006, GC, mt, 7 ex (CNBFVR); 27.VI–11.VII.2006, GC, mt, 4 ex (CNBFVR); 11–25.VII.2006, GC, mt, 3 ex (CNBFVR); 8–22.VIII.2006, GC, mt, 5 ex (CNBFVR); 5–19.IX.2006, GC, mt, 1 ex (CNBFVR); 19.IX–3.X.2006, GC, mt, 4 ex (CNBFVR); Iglesias, Lago Corsi, 15.V.1995, FA, 2 ex (ACF); Iglesias, dint. San Benedetto, 550 m, 8.IX.2006, GN, nt, 4 ex (CNBFVR); Iglesias, Vecchia Cantoniera Marganai, 491 m, 23.V.2006, PCo MB DB DW, nt, 1 ex (CNBFVR); Isola Sant'Antioco, CM, 3 ex (MCC). **Medio Campidano prov.:** Villacidro, CM, 6 ex (MCC); Villacidro, Rio Cannisoni, radura

sponda sinistra, 401 m, 19–24.V.2006, MB DB PCo DW, mt, 1 ex (CNBFVR). **Nuoro prov.:** Baronia, Siniscola, Capo Comino, 27.VI–3.VII.2004, PCo GS, sn, 1 ex (CPC); Baronia, Siniscola, Case Capo Comino, 20–29.VI.2007, PC, sn, 1 ex (CPC); [Baronia,] Siniscola, Monte Albo, 4.V.1995, FA, 2 ex (ACF); Baronia, Siniscola, Monte Albo, 600–800 m, 30.VI.2004, PCo GS, sn, 3 ex (CPC); Baronia, Siniscola, Monte Albo, 700–900 m, 22.VI.2007, PCo GS, sn, 1 ex (CPC); Baronia, Torpè, between Lago Posada and Concas, 140 m, 8.VII.2004, PCo GS, sn, 1 ex (CPC); M.ti del Gennargentu, Bruncu Spina, 1200–1500 m, 4.VII.2004, PCo GS, sn, 2 ex (CPC). **Ogliastra prov.:** Gairo, Monte Perda Liana, 1219 m, 16.V.2008, GN PA MB MTr, sn, 2 ex (CNBFVR); Seui, CM, 2 ex (MCC); Seui, dint. Monte Tonneri, 876 m, 5.IX.2006, GN, sn, 1 ex (CNBFVR); Seui, dint. Monte Tonneri, 919 m, 5.IX.2006, GN, sn on *Euphorbia* sp., 2 ex (CNBFVR); dint. Talana, 478 m, 15.V.2008, GN PA MB MTr, sn, 1 ex (CNBFVR). **Olbia-Tempio prov.:** Golfo Aranci, 2.V.1995, FA, 6 ex (ACF); Isola Mortorio, 3.VII.1987, VV, 3 ex (MCZR); Isola Razzoli, 30.VI.1987, VV, 1 ex (MCZR); Isola Soffi, 3.VII.1987, VV, 1 ex (MCZR); Monte Limbara, pendici Nord–Ovest, 1100–1200 m, 29.V.1995, FA, 1 ex (ACF); Olbia, Strada Statale 125 su Rio Padragianu, 3.V.1995, FA, 3 ex (ACF). **Oristano prov.:** Terralba, Stagno di Marceddi, 25.V.2006, MB DB PCo DW, sn, 1 ex (CNBFVR). **Sassari prov.:** Alghero, CM, 2 ex (MCC); Alghero, Isola Piana, 29.VI.1987, VV, 1 ex (MCZR); Monte Limbara, 1200 m, 7.VII.2004, PCo GS, sn, 1 ex (CPC); Passo Limbara, Strada Statale 392, 650 m, 7.VII.2004, PCo GS, sn, 1 ex (CPC); Porto Torres, Isola dell'Asinara, Cala d'Arena, 1.VII.1987, VV, 6 ex (MCZR).

DISTRIBUTION. Mediterranean Region.

NOTES. In Italy this species reaches the southern part of the Po Plain (cf. Canepari 1983). As shown by Capra (1976) the elytral spot varies according to geographic distribution. Sardinian specimens resemble those of central Italy, but body size tends to be smaller compared to that of continental ones. Some of the above-mentioned records (MCC) were already published by Canepari (1983).

15. *Scymnus (Scymnus) nubilus* Mulsant, 1850

MATERIAL EXAMINED. **Cagliari prov.:** Cagliari, città [= in town], X.1978, CM, 6 ex (MCC); Stagno di Molentargius, CM, 9 ex (MCC).

DISTRIBUTION. Mediterranean Region, all of Africa, Palearctic Asia, all of India and Sri Lanka.

NOTES. Species once known as *S. (S.) levaillanti* Mulsant, 1850, but Canepari (2001) demonstrated that *S. (S.) levaillanti* must be referred to another species.

16. *Scymnus (Scymnus) rubromaculatus* (Goeze, 1778)

MATERIAL EXAMINED. **Cagliari prov.:** Campu Omu, VI.1956, LC, 1 ex (CCSD).

DISTRIBUTION. All of Europe, Kazakhstan, central and northern Asia.

NOTES. Very common in all of Europe but apparently rare in Sardinia.

17. *Scymnus (Scymnus) rufipes rufipes* (Fabricius, 1798)

MATERIAL EXAMINED. **Cagliari prov.:** Cagliari, Monte Uripinu, VI.1998, CM, 3 ex (CCSD); Costa Rei, VII.1988, VB, dc, 1 ex (CPC); dint. Geremeas, CM, 3 ex (MCC); Quartu Sant'Elena, CM, 1 ex (MCC); Quartu Sant'Elena, Stagno di Simbirizzi, CM, 2 ex (MCC); Serdiana, CM, 1 ex (MCC); Siliqua, CM, 1 ex (MCC); Stagno di Chia, 17.VII.1980, CM, 1 ex (MCC); Stagno di Molentargius, CM, 1 ex (MCC). **Carbonia-Iglesias prov.:** Buggerru, CM, 1 ex (MCC); Domusnovas, Valle Oridda, 592 m, 16–30.V.2006, GC, mt, 1 ex (CNBFVR); Gonnesa, CM, 1 ex (MCC). **Nuoro prov.:** Baronia, dint. Case Capo Comino, Sorg. Bèrchida, Strada Statale 125 km 243, 10.VII.2001, PCo, sn, 1 ex (CPC); Catena del Marghine, pendici NE, strada Bolotana–Burgos, 22.V.1995, FA, 1 ex (ACF); Macomer, CM, 1 ex (MCC). **Ogliastra prov.:** Gairo, Monte Tonneri, dint. nuraghe Ardassai, 1020 m, 16.V.2008, MB GN PA MTr, oe on *Crataegus* sp., 1 ex (CNBFVR). **Oristano prov.:** Assemini, Rio Cixerri, CM, 3 ex (MCC); Stagno di Cabras, 19.V.1995, FA, 1 ex (ACF); Oristano, CM, 2 ex (MCC). **Sassari prov.:** Alghero, CM, 3 ex (MCC); La Nurra, Parco Reg. Porto Conte, Foresta demaniale "Le Prigionette", 6.VII.1999, PCo, dc, 1 ex (CPC); Tula, Lago Coghinas, 27.V.1995, FA, 1 ex (ACF).

DISTRIBUTION. Mediterranean Region.

NOTES. *Scymnus (S.) r. gallicus* Capra & Fürsch, 1967 lives in southern France and the Iberian Peninsula; it has the elytral spot not reaching the outer margin. Most of the above-mentioned records were already published by Canepari (1983).

18. *Nephus (Bipunctatus) bisignatus bisignatus* (Bohemann, 1850)

MATERIAL EXAMINED. **Cagliari prov.:** Quartu Sant'Elena, Stagno di Simbirizzi, CM, 2 ex (MCC). **Nuoro prov.:** Siniscola, Monte Albo, 4.V.1995, FA, 1 ex (ACF).

DISTRIBUTION. Europe.

NOTES. This species and *N. (B.) nigricans* Weise, 1879 have a very similar male genital apparatus and most distinguishing features are in external characters. Fürsch (1965) split *N. bisignatus* into three subspecies: *N. b. bisignatus* in northern Europe, *N. b.*

etesiacus Fürsch, 1965 in Dalmatia (Croatia), and *N. b. claudiae* Fürsch, 1965 in southern Germany. The specimens from Italy and Sardinia are identical to *N. b. bisignatus*.

19. *Nephus (Bipunctatus) kiesenwetteri* Mulsant, 1850

MATERIAL EXAMINED. **Cagliari prov.:** Cagliari, CM, 4 ex (MCC); Campu Omu, CM, 3 ex (MCC); Capitana, Rio Cuba 3 ex (MCC); Capoterra, CM, 3 ex (MCC); foce Fiume Flumendosa 13.V.1995, FA, 2 ex (ACF); Pula, CM, 3 ex (MCC); Quirra, CM, 4 ex (MCC); San Priamo, Rio Sa Picocca, 12.V.1995, FA, 1 ex (ACF). **Carbonia-Iglesias prov.:** Iglesias, Fontanamara, 15.V.1995, FA, 1 ex (ACF). **Medio Campidano prov.:** Arbus, Piscinas, 0 m, 26.III.2006, DB, nt, 1 ex (CNBFVR). **Olbia-Tempio prov.:** Olbia, Strada Statale 125 su Rio Padragianu, 3.V.1995, FA, 20 ex (ACF). **Oristano prov.:** Assemini, V.1995, FA, 1 ex (ACF).

DISTRIBUTION. Mediterranean Region.

NOTES. Species not rare on *Tamarix* sp.

20. *Nephus (Bipunctatus) nigricans nigricans* (Weise, 1879)

MATERIAL EXAMINED. **Cagliari prov.:** Capitana, Rio Cuba, CM, 2 ex (MCC). **Carbonia-Iglesias prov.:** Domusnovas, sa Duchessa, 371 m, 2–16.V.2006, GC, mt, 1 ex (CNBFVR); 16–30.V.2006, GC, mt, 2 ex (CNBFVR); 30.V–13.VI.2006, GC, mt, 1 ex (CNBFVR); 13–27.VI.2006, GC, mt, 1 ex (CNBFVR); 27.VI–11.VII.2006, GC, mt, 1 ex (CNBFVR); Domusnovas, Valle Oridda, 592 m, 27.VI–11.VII.2006, GC, mt, 1 ex (CNBFVR); 22.VIII–5.IX.2006, GC, mt, 1 ex (CNBFVR); Iglesias, dint. colonia Beneck, 636 m, 27.VI–11.VII.2006, GC, mt, 4 ex (CNBFVR). **Nuoro prov.:** Gennargentu, Bruncu Spina, 1200–1500 m, 4.VII.2004, PCo GS, sn, 1 ex (CPC).

DISTRIBUTION. Mediterranean Region.

NOTES. See under *N. (B.) bisignatus*.

21. *Nephus (Nephus) ludyi* (Weise, 1879)

MATERIAL EXAMINED. **Carbonia-Iglesias prov.:** Domusnovas, sa Duchessa, 371 m, 2–16.V.2006, GC, mt, 1 ex (CNBFVR); Domusnovas, Valle Oridda, 592 m, 3–17.X.2006, GC, mt, 1 ex (CNBFVR); Iglesias, dint. colonia Beneck, 636 m, 13–27.VI.2006, GC, mt, 1 ex (CNBFVR).

DISTRIBUTION. Mediterranean Region.

NOTES. A scarce species, living on *Quercus* sp.

22. *Nephus (Nephus) peyerimhoffi* Sicard, 1923

DISTRIBUTION. Algeria, Tunisia, Canary Islands and

Sardinia (cf. Sicard 1923; Canepari 2009).

NOTES. Species recently discussed by Canepari (2009).

23. *Nephus (Nephus) schatzmayri* Canepari & Tedeschi, 1977

MATERIAL EXAMINED. **Medio Campidano prov.:** Villacidro, rive Rio Cannisoni, 375 m, 24.III.2006, PCo, sn, 1 ex (CNBFVR). **Nuoro prov.:** Desulo, Rio Aratu, 958 m, 16.V.2008, GN PA MB, oe on *Crataegus* sp., 1 ex (CNBFVR). **Ogliastra prov.:** Seui, dint. Monte Tonneri, 825 m, 17–20.V.2008, GN MB, mt, 1 ex (CNBFVR).

DISTRIBUTION. Portugal, Andorra, France, Greece (cf. Kovář 2007), mainland Italy, Sicily, Sardinia, Malta and Croatia (Dalmatia) (Canepari 2009).

NOTES. Species recently discussed by Canepari (2009).

24. *Nephus (Sidis) hiekei* Fürsch, 1965

MATERIAL EXAMINED. **Cagliari prov.:** Costa Rei, 12.V.1985, FA, 1 ex (ACF); Giorigino, III.1938, UL, 2 ex (MCSG). **Medio Campidano prov.:** Arbus, V.1998, FA, 1 ex (CCSD). **Nuoro prov.:** Baronia, Siniscola, Capo Comino, VII.2001, PCo, sn, 1 ex (CPC). **Oristano prov.:** Putzu Idu, 26.V.1998, VR, 1 ex (CCSD).

DISTRIBUTION. Mediterranean Region.

NOTES. The colouration of Sardinian specimens varies from entirely yellow to completely black.

25. *Scymniscus anomus* (Mulsant, 1852)

MATERIAL EXAMINED. **Cagliari prov.:** Elmas, CM, 1 ex (MCC).

DISTRIBUTION. Spain, France, Italy and Greece.

NOTES. Species widespread but uncommon in Italy. Rare in Sardinia.

26. *Scymniscus semirufus* (Weise, 1885)

MATERIAL EXAMINED. **Cagliari prov.:** Costa Rei, 12.V.1995, FA, 8 ex (ACF; CCSD); Giorigino, III.1938, UL, 8 ex (CCSD; MCSV); Sarrabus, Rio Sa Picocca, CM, 3 ex (MCC); Siliqua, CM, 1 ex (MCC). **Carbonia-Iglesias prov.:** Domusnovas, sa Duchessa, 371 m, 16–30.V.2006, GC, mt, 1 ex (CNBFVR); 13–27.VI.2006, GC, mt, 7 ex (CNBFVR); 27.VI–11.VII.2006, GC, mt, 4 ex (CNBFVR); 11–25.VII.2006, GC, mt, 29 ex (CNBFVR); 25.VII–8.VIII.2006, GC, mt, 14 ex (CNBFVR); 8–22.VIII.2006, GC, mt, 3 ex (CNBFVR); 22.VIII–5.IX.2006, FC, mt, 2 ex (CNBFVR); 5–19.IX.2006, GC, mt, 3 ex (CNBFVR); 19.IX–3.X.2006, GC, mt, 2 ex (CNBFVR);

Domusnovas, Valle Oridda, 595 m, 13–27.VI.2006, GC, mt, 2 ex (CNBFVR); 27.VI–11.VII.2006, GC, mt, 1 ex (CNBFVR); 22.VIII–5.IX.2006, GC, mt, 2 ex (CNBFVR); Iglesias, dint. colonia Beneck, 636 m, 16–30.V.2006, GC, mt, 1 ex (CNBFVR); 13–27.VI.2006, GC, mt, 3 ex (CNBFVR); 27.VI–11.VII.2006, GC, mt, 6 ex (CNBFVR); 11–25.VII.2006, FC, mt, 1 ex (CNBFVR); GC, 17 ex (CNBFVR); 25.VII–8.VIII.2006, GC, mt, 4 ex (CNBFVR); 8–22.VIII.2006, GC, mt, 4 ex (CNBFVR); 22.VIII–5.IX.2006, GC, mt, 1 ex (CNBFVR); 5–19.IX.2006, GC, mt, 1 ex (CNBFVR); 19.IX–3.X.2006, GC, mt, 1 ex (CNBFVR); 3–17.X.2006, GC, mt, 1 ex (CNBFVR).

Medio Campidano prov.: Arbus, Piscinas, 0 m, 14.VII.2006, DA DB PCe MM DW, nt, 1 ex (CNBFVR). **Nuoro prov.:** Baronia, dint. Case Capo Comino, Sorg. Bérchida, Strada Statale 125 km 243, 10.VII.2001, PCo, sn, 1 ex (CPC); Baronia, Sini-scola, Monte Albo, 600–800 m, 8.VII.2001, PCo GS, sn, 1 ex (CPC); Borore, CM, 1 ex (MCC); Bruncu Spina, 7.V.1995, FA, 1 ex (ACF). **Ogliastra prov.:** Seui, dint. Monte Tonneri, 876 m, 5.IX.2006, GN, sn, 1 ex (CNBFVR). **Oristano prov.:** dint. Oristano, CM, 2 ex (MCC). **Sassari prov.:** Lago Baratz, 23.V.1991, FA, 1 ex (ACF); Passo Limbara, Strada Statale 392, 650 m, 7.VII.2004, PCo GS, sn, 1 ex (CPC); Torralba, 8.XI.1981, CM, 4 ex (CCSD; MCC).

DISTRIBUTION. Corsica, Sardinia, Italian mainland, Dalmatia (Croatia) and Turkey (cf. Canepari 2000, as *Nephus (Sidis) semirufus*).

NOTES. Species described from Corsica on the basis of four specimens (cf. Canepari 2000, as *N. (S.) semirufus*). It is the commonest species of *Scymniscus* Dobzhansky, 1928 in Sardinia.

27. *Diomus rubidus* (Motshulsky, 1835)

DISTRIBUTION. Species widespread from the Mediterranean Region to central Asia (Kovář 2007).

NOTES. Firstly recorded from Sardinia by Canepari (2009).

28. *Clitostethus arcuatus* (Rossi, 1794)

MATERIAL EXAMINED. **Cagliari prov.:** Cagliari, CM, 3 ex (CCSD; MCC). **Carbonia-Iglesias prov.:** Domusnovas, sa Duchessa, 371 m, 21.III–4.IV.2006, GC, mt, 2 ex (CNBFVR); 4–18.IV.2006, GC, mt, 3 ex (CNBFVR); 2–16.V.2006, GC, mt, 1 ex (CNBFVR); 16–30.V.2006, GC, mt, 1 ex (CNBFVR); Domusnovas, Sedda Pranu Cardu, 549 m, 20–24.V.2006, MB, DB, PCo & DW, 1 ex (CNBFVR); Domusnovas, Valle Oridda, 592 m, 21.III–4.IV.2006, GC, mt, 2 ex (CNBFVR); 2–16.V.2006, GC, mt, 1 ex (CNBFVR); 30.V–13.VI.2006, GC, mt, 2 ex (CNBFVR); Iglesias, dint. colonia Beneck, 636 m, 4–18.IV.2006, GC, mt, 1 ex (CNBFVR); 16–30.V.2006, GC, mt, 4 ex (CNBFVR); 30.V–13.VI.2006, GC, mt, 1 ex (CNBFVR); Igle-

sias, Marganai, plot CONECOFOR SAR1, 700 m, 16.II–15.VI.2004, DB PCe GN DW, mt, 2 ex (CNBFVR).

DISTRIBUTION. Central and southern Europe, Mediterranean Region, Canary Islands and Madeira; introduced in Chile.

NOTES. Species not common but generally found in several specimens. Adults and larvae attack Aphidiidae, Aleyrodidae (Homoptera) and Tetranychidae (Acari) (Gourreau 1974).

29. *Cryptolaemus montrouzieri* Mulsant, 1853

MATERIAL EXAMINED. **Cagliari prov.:** Cagliari 16.XI.1980, PL, 12 ex (CCSD).

DISTRIBUTION. Species native of Australia, which was introduced and has become acclimated in many areas (Mediterranean Basin, Canary Islands, USA, Java, Chile, French Guyana).

NOTES. It was imported from Australia to Italy by F. Silvestri in 1908 (cf. Canepari 2007) for biological control of many Coccidae (Homoptera); it is found especially on orange and lemon trees and on several species of *Pittosporum*.

30. *Hyperaspis algerica* Crotch, 1874

MATERIAL EXAMINED. **Cagliari prov.:** Asuni Sardo, 2 ex (MCSV); Cagliari, 3 ex (MCSV); Cagliari, IV.1938, UL, 2 ex (CCSD); Decimomannu, CM, 3 ex (MCC); Geremeas, Rio Geremeas, CM, 2 ex (MCC); Santa Margherita di Pula, IV.1975, L?, 1 ex (CCSD); Siliqua, CM, 1 ex (MCC); Villaputzu, CM, 1 ex (MCC); Villasimius, VI.1997, RR, 1 ex (CCSD); Villaspesciosa, CM, 2 ex (MCC). **Carbonia-Iglesias prov.:** Domusnovas, sa Duchessa, 371 m, 7.IX.2006, MB DA DB GN, sn, 1 ex (CNBFVR); Domusnovas, Valle Oridda, 592 m, 27.VI–11.VII.2006, GC, mt, 1 ex (CNBFVR); 11–25.VII.2006, GC, mt, 3 ex (CNBFVR); 25.VII–8.VIII.2006, GC, mt, 6 ex (CNBFVR); Iglesias, dint. colonia Beneck, 636 m, 27.VI–11.VII.2006, GC, mt, 2 ex (CNBFVR); 11–25.VII.2006, GC, mt, 5 ex (CNBFVR); 25.VII–8.VIII.2006, GC, mt, 1 ex (CNBFVR). **Medio Campidano prov.:** Serrenti, 7.I.1979, CM, 1 ex (MCC). **Nuoro prov.:** Fonni, Monte Spada, VII.1990, LF, 1 ex (CCSD); Nurallao, 7.V.2000, LF, 1 ex (CCSD); Seui, S. Girolamo, VI.1997, LF, 2 ex (CCSD). **Olbia-Tempio prov.:** Oschiri, 16.V.1973, CL, 1 ex (CCSD). **Oristano prov.:** Oristano, 24.IV.1979, SRI, 1 ex (CCSD); Oristano, CM, 2 ex (MCC); Santa Giusta, L?, 1 ex (MCSV). **Sassari prov.:** Alghero, loc. Mamuntanas, L?, 1 ex (MCSV); Burgos, 10.III.2003, LF, 20 ex (CCSD); Ossi, 20.VIII.1975, 1 ex (CCSD); Ozieri, L?, 1 ex (MCSV); Sorso, L?, 3 ex (MCSV).

DISTRIBUTION. Morocco, Algeria, Tunisia, southern

France, Corsica and Sardinia.

NOTES. This is the commonest *Hyperaspis* Dejean, 1833 species in Sardinia.

31. *Hyperaspis duvergeri* Fürsch, 1985

MATERIAL EXAMINED. **Carbonia-Iglesias prov.:** Iglesias, dint. colonia Beneck, 636 m, 13–27.VI.2006, GC, mt, 1 ex (CNBFVR); 25.VII–8.VIII.2006, GC, mt, 1 ex (CNBFVR); 11–25.VII.2006, GC, mt, 2 ex (CNBFVR); Domusnovas, sa Duchessa, 371 m, 30.V–13.VI.2006, GC, mt, 1 ex (CNBFVR); Domusnovas, Valle Orida, 592 m, 11–25.VII.2006, GC, mt, 3 ex (CNBFVR); 22.VIII–5.IX.2006, GC, mt, 1 ex (CNBFVR). **Nuoro prov.:** Gocèano, dint. Bono, 750 m, 24.VI.2007, PCo GS, sn, 2 ex (CPC).

DISTRIBUTION. Portugal, Spain, Morocco, Algeria, Corsica, southern France, mainland Italy, Sicily, Sardinia, Ponza Island (Latium), Giglio Island (Tuscany), Dalmatia (Croatia) and Hungary (cf. Canepari 2009).

NOTES. Species firstly recorded from Sardinia by Canepari (2009).

32. *Hyperaspis inexpectata* Günther, 1959

DISTRIBUTION. Spain, central Europe, southern France, southern Italy, Dalmatia (Croatia), Bosnia and Crete (Greece) (cf. Canepari 2009).

NOTES. Species firstly recorded from Sardinia by Canepari (2009), who resurrected it from synonymy with *H. (H.) concolor* Suffrian, 1843.

33. *Platynaspis luteorubra* (Goeze, 1777)

MATERIAL EXAMINED (*P. luteorubra* f. *luteorubra*). **Cagliari prov.:** Elmas, CM, 3 ex (MCC); Pula, CM, 4 ex (MCC); Siliqua, CM, 1 ex (MCC). **Carbonia-Iglesias prov.:** Domusnovas, Valle Orida, 592 m, 13–27.VI.2006, GC, mt, 1 ex (CNBFVR); 11–25.VII.2006, GC, mt, 5 ex (CNBFVR); 25.VII–8.VIII.2006, GC, mt, 1 ex (CNBFVR); Gonnesa, 2 ex (MCSG); Iglesias, dint. colonia Beneck, 636 m, 13–27.VI.2006, GC, mt, 1 ex (CNBFVR). **Oristano prov.:** Oristano, CM, 2 ex (MCC); Cabras, Tharros, dune, 9 m, 18.V.2008, GN PA MB MTr, sn, 1 ex (CNBFVR). **Nuoro prov.:** Aritzo, 1 ex (MCSG); Baronia, Siniscola, Monte Albo, 600–800 m, 30.VI.2004, PCo GS, sn, 2 ex (CPC); Borore, CM, 2 ex (MCC); Seui, CM, 1 ex (MCC). **Sassari prov.:** Pattada, CM, 3 ex (MCC); Ploaghe, 1 ex (MCSG).

MATERIAL EXAMINED (*P. luteorubra* f. *confluens* Mulsant, 1846).

Cagliari prov.: Campu Omu, CM, 3 ex (MCC); Capitana, CM, 3 ex (MCC); Elmas, 1 ex (MCSG); Monte Sette Fratelli, L?, 5 ex (MCSG). **Carbonia-Iglesias prov.:** Domusnovas, sa Duchessa,

371 m, 16–30.V.2006, GC, mt, 1 ex (CNBFVR). **Nuoro prov.:** Aritzo, L?, 2 ex (MCSG); Seui, CM, 5 ex (MCC). **Olbia-Tempio prov.:** Alà dei Sardi, L?, 1 ex (MCSG); Tempio Pausania, L?, 1 ex (MCSG). **Oristano prov.:** Oristano, CM, 5 ex (MCC).

DISTRIBUTION. Central and southern Europe, western Asia.

NOTES. The above colour form (*confluens*) is endemic to Sardinia and Corsica; about 30% of the examined specimens belong to it.

34. *Chilocorus bipustulatus* (Linnaeus, 1758)

MATERIAL EXAMINED. **Cagliari prov.:** Cagliari, CM, 2 ex (MCC). **Carbonia-Iglesias prov.:** Domusnovas, sa Duchessa, 371 m, 30.V–13.VI.2006, GC, mt, 2 ex (CNBFVR); 13–27.VI.2006, GC, mt, 1 ex (CNBFVR); 27.VI–11.VII.2006, GC, mt, 1 ex (CNBFVR); 7.IX.2006, MB, dc, 1 ex (CNBFVR); 24.IX.2004, FM, dc, 2 ex (CNBFVR); Iglesias, Marganai, plot CONECOFOR SAR1, 700 m, 16.VI–14.VII.2005, GC, mt, 2 ex (CNBFVR); Iglesias, Vecchia Cantoniera Marganai, 491 m, 9.VI.2004, GN, sn, 1 ex (CNBFVR); S. Antioco, Calasetta, VII.2003, MA, 1 ex (CNBFVR); S. Antioco, Isola La Vacca, 26.VI.1987, VV, 1 ex (MCZR). **Medio Campidano prov.:** Villacidro, rive Rio Cannisoni, 375 m, 24.III.2006, PCo, sn, 1 ex (CNBFVR); Villacidro, rive Rio Cannisoni, 382 m, 25.III.2006, PCo, sn, 4 ex (CNBFVR). **Oristano prov.:** Oristano, CM, 1 ex (MCC).

DISTRIBUTION. All of Europe (except northern parts), Mediterranean Region, Palaearctic Asia and USA (California) (introduced successfully in 1951).

NOTES. Common on grasses and trees.

35. *Exochomus quadripustulatus* (Linnaeus, 1758)

MATERIAL EXAMINED. **Cagliari prov.:** Cagliari, CM, 4 ex (MCC). **Carbonia-Iglesias prov.:** Domusnovas, Bega d'Aleni, 621 m, 24.V.2006, PCo MB DB DW, sn, 1 ex (CNBFVR); Domusnovas, sa Duchessa, 371 m, 4–18.IV.2006, GC, mt, 2 ex (CNBFVR); 30.V–13.VI.2006, GC, mt, 1 ex (CNBFVR); 27.VI–11.VII.2006, FC, mt, 1 ex (CNBFVR). **Medio Campidano prov.:** Arbus, Piscinas, 0 m, 26.III.2006, DB, nt, 1 ex (CNBFVR); Villacidro, dint. P.ta piscina Argiolas, Serbatoio, 282 m, 20.III.2006, PCo, dc on the ground, 1 ex (CNBFVR); Villacidro, rive Rio Cannisoni, 375 m, 24.III.2006, DB DW, nt, 4 ex (CNBFVR); Villacidro, rive Rio Cannisoni, 376 m, 24.III.2006, MB, sn, 1 ex (CNBFVR); Villacidro, rive Rio Cannisoni, 382 m, 25.III.2006, PCo, sn, 4 ex (CNBFVR); Villacidro, Rio Cannisoni, sorg. s'acqua Frischedda, 372 m, 25.III.2006, MB, sn, 1 ex (CNBFVR).

DISTRIBUTION. Palaearctic Region, Australia, USA (California).

NOTES. Eurytopic species. It was moved to the genus

Brumus Mulsant, 1850 by Kovář (1995), but Ślipiński & Giorgi (2006) consider *Brumus* Mulsant, 1840 as a junior synonym of *Exochomus* Redtenbacher, 1843.

36. *Rodolia cardinalis* (Mulsant, 1850)

MATERIAL EXAMINED. **Cagliari prov.:** Cagliari, CM, 2 ex (MCC). **Nuoro prov.:** Baronia, Siniscola, Capo Comino, 3–5.VII.2000, PCo, sn, 1 ex (CPC); 27.VI–3.VII.2004, PCo GS, sn, 1 ex (CPC).

DISTRIBUTION. Subcosmopolitan (temperate regions). NOTES. Species native of Australia, introduced in North America (California), as reported by Timberlake (1943), by Koebele in 1888–1889 to fight *Peryceria purchasi* (Maskell, 1878) (Homoptera, Margarodidae); this coccinellid was subsequently imported to several other countries and is now present in many temperate regions of Europe, Asia, North and southern Africa, America and Australia (cf. Canepari 2007).

37. *Coccidula scutellata* (Herbst, 1783)

MATERIAL EXAMINED. **Cagliari prov.:** Bivio Chia, stagno, 14.V.1995, FA, 1 ex (ACF); Cagliari, Terramaini, CM, 3 ex (MCC); Elmas, CM, 2 ex (MCC); Macchiareddu, X.1985, LF, 9 ex (CCSD).

DISTRIBUTION. All of Europe (except North), North Africa and western Asia.

NOTES. Species common in marshy biotopes.

38. *Rhyzobius chrysomeloides* (Herbst, 1792)

MATERIAL EXAMINED. **Cagliari prov.:** Serdiana, 8.VI.2003, LF, 1 ex (CCSD); Solanas, 2.IV.2004, GS SF, sn, 1 ex (CPC); Uta, 1.IV.2000, LF, 22 ex (CCSD). **Carbonia-Iglesias prov.:** Iglesias, Marganaì, plot CONECOFOR SAR1, 700 m, 16.II–15.VI.2004, GC, mt, 2 ex (CNBFVR). **Nuoro prov.:** Baronia, Bérchida, spiaggia, 6.VII.2004, PCo GS, 1 ex (CPC); Baronia, Torpè, between Lago Posada and Concas, 140 m, 8.VII.2004, PCo GS, sn, 1 ex (CPC); Monte Albo, 2.IX.2001, LF, 2 ex (CCSD). **Oristano prov.:** Oristano, CM, 1 ex (MCC). **Sassari prov.:** Gocèano, dint. Bono, 750 m, 24.VI.2007, PCo GS, sn, 1 ex (CPC); Gocèano, dint. Bultei, 650 m, 24.VI.2007, PCo GS, sn, 3 ex (CPC); Gocèano, between Anela and Bultei, 500 m, 24.VI.2007, PCo GS, sn, 1 ex (CPC); Mara, XII.1982, AFr, 1 ex (CCSD).

DISTRIBUTION. Central and western Europe.

NOTES. This species lives on *Pinus* spp., and is uncommon in Italy.

39. *Rhyzobius litura* (Fabricius, 1787)

MATERIAL EXAMINED. **Carbonia-Iglesias prov.:** Domusnovas, Valle Oridda, 592 m, 21.III–4.IV.2006, GC, mt, 1 ex (CNBFVR); 27.VI–11.VII.2006, GC, mt, 1 ex (CNBFVR). **Medio Campidano prov.:** Pabillonis, 20.V.1995, FA, 1 ex (ACF). **Nuoro prov.:** Bara, CM, 3 ex (MCC); Baronia, Siniscola, Case Capo Comino, 26.VI.2007, PCo, sn, 1 ex (CPC); Catena del Marghine, pendici NE, strada Bolotana–Burgos, 22.V.1995, FA, 4 ex (ACF). **Olbia-Tempio prov.:** Olbia, CM, 4 ex (MCC). **Oristano prov.:** Oristano, CM, 3 ex (MCC); Putzu Idu, 26.V.1998, CC, 1 ex (CCSD); Sedilo, 19.V.1995, FA, 1 ex (ACF). **Sassari prov.:** Alghero, 25.V.1995, FA, 1 ex (ACF); foce Fiume Coghinna, 19.VI.2003, GL, 1 ex (CCSD); Oschiri, 18.V.1973, CL, 1 ex (CCSD); Romana, 28.XI.1978, AFr, 1 ex (CCSD); Tula, Lago Coghinna, 27.V.1995, FA, 2 ex (ACF).

DISTRIBUTION. Europe, Mediterranean Region and Canary Islands.

NOTES. Species common on grasses.

40. *Rhyzobius lophanthae* Blaisdell, 1892

MATERIAL EXAMINED. **Cagliari prov.:** Cagliari, CM, 1 ex (MCC); Capitana, CM, 1 ex (MCC); Chia, CM, 2 ex (MCC); Pula, 3.VI.2001, LF, 1 ex (CCSD); Quartu Sant'Elena, Cala Regina, loc. Capitana, CM, 4 ex (MCC); Quartu Sant'Elena, Geremeas, CM, 3 ex (MCC); Uta, CM, 2 ex (MCC). **Carbonia-Iglesias prov.:** Domusnovas, sa Duchessa, 371 m, 16–30.V.2006, GC, mt, 1 ex (CNBFVR); 30.V–13.VI.2006, GC, mt, 1 ex (CNBFVR); 13–27.VI.2006, GC, mt, 2 ex (CNBFVR); 22.VIII–5.IX.2006, FC, mt, 1 ex (CNBFVR); Iglesias, dint. colonia Beneck, 636 m, 21.III–4.IV.2006, GC, mt, 1 ex (CNBFVR); 13–27.VI.2006, GC, mt, 10 ex (CNBFVR); 27.VI–11.VII.2006, GC, mt, 2 ex (CNBFVR); 11–25.VII.2006, FC, mt, 1 ex (CNBFVR); 25.VII–8.VIII.2006, GC, mt, 1 ex (CNBFVR); 22.VIII–5.IX.2006, GC, mt, 1 ex (CNBFVR); 5–19.IX.2006, GC, mt, 2 ex (CNBFVR); 19.IX–3.X.2006, GC, mt, 3 ex (CNBFVR); Iglesias, Monte S. Miai, 17.XII.2002, LF, 1 ex (CCSD). **Olbia-Tempio prov.:** Olbia, Strada Statale 125 su Rio Padragianu, 3.V.1995, FA, 2 ex (ACF). **Oristano prov.:** Putzu Idu, 26.V.1998, CC VR, 4 ex (CCSD); Stagno di Cabras, 19.V.1995, FA, 1 ex (ACF). **Sassari prov.:** Isola dell'Asinara, Cala d'Arena, 1.VII.1987, VV, 2 ex (MCZR).

DISTRIBUTION. Subcosmopolitan.

NOTES. Species native of Australia and New Zealand, introduced in many areas (central and southern Europe, Mediterranean Region, Canary Islands, Madeira, India, southern USA, Chile) for the biological control of two species of Diaspididae (Homoptera) (cf. Canepari 2007).

NOTES. Not rare on trees and grasses.

41. *Hippodamia (Hippodamia) variegata* (Goeze, 1777)

MATERIAL EXAMINED. **Cagliari prov.:** Cagliari, CM, 3 ex (MCC); Cagliari, Monte Claro, VI.1998, LF, 1 ex (CCSD). **Nuoro prov.:** Baronia, Siniscola, Capo Comino, spiaggia, VII.2001, PCo, 3 ex (CPC); 20.VI.2007, GS, dc on *Eryngium maritimum*, 1 ex (CPC); Baronia, Siniscola, Case Capo Comino, 27.VI–3.VII.2004, PCo GS, sn, 2 ex (CPC); Baronia, Siniscola, Monte Albo, 700–900 m, 22.VI.2007, PCo GS, sn, 1 ex (CPC); Genargentu, Brunco Spina, 1200–1500 m, 4.VII.2004, PCo GS, sn, 3 ex (CPC); Ottana, 19.VII.1974, L?, 1 ex (CCSD).

DISTRIBUTION. Palaearctic Region, eastern and southern Africa.

NOTES. One of the commonest species of the family; it lives on shrubs and grasses. It was recorded also from Monteponi near Iglesias by Della Beffa (1913).

42. *Ceratomegilla (Ceratomegilla) undecimnotata* (Schneider, 1792)

DISTRIBUTION. Eastern and southern Europe, western and central Asia.

NOTES. A predator of Aphidiidae (Homoptera) on shrubs and grasses. Della Beffa (1913) recorded it from San Vito (Cagliari prov.) on material collected by R. Gestro.

43. *Anisosticta novemdecimpunctata* (Linnaeus, 1758)

DISTRIBUTION. Europe, western and central Asia, Mongolia and Siberia.

NOTES. Species occurring in marshy biotopes on *Phragmites communis*. It was recorded from Sorgono (Nuoro prov.) by Della Beffa (1913) on the basis of specimens collected by A. Krausse; I am not aware of any other Sardinian records.

44a. *Adalia (Adalia) bipunctata bipunctata* (Linnaeus, 1758)

MATERIAL EXAMINED. **Cagliari prov.:** Cagliari, CM, 10 ex (MCC); Chia, CM, 4 ex (MCC); Elmas, V.1990, LF, 1 ex (CCSD); Serri, 2.VI.1992, LF, 1 ex (CCSD). **Olbia-Tempio prov.:** Tempio Pausania, 10.V.1960, L?, 1 ex (CCSD). **Nuoro prov.:** Fluminese, dint. Arcu Genna Bogai, 400 m, 5.IV.2004, GS SF, sn, 3 ex (CPC); Nurri, 1.IV. 2003, LF, 1 ex (CCSD).

DISTRIBUTION. Holarctic Region (Azores Islands and North Africa included), Asia and Chile (Tierra del Fuego).

NOTES. Common on grasses where it predaes mainly

aphids but also mites, Psyllidae (Homoptera) and larvae of Chrysomelidae (Coleoptera).

44b. *Adalia (Adalia) bipunctata revelierei* Mulsant, 1866

DISTRIBUTION. Spain, Sardinia, Corsica, Caucasus, Middle East and northern central Asia.

NOTES. This subspecies is considered by Iablokoff-Khnzorian (1982) and Kovář (2007) as a synonym of *A. bipunctata*. In rearings, the nominal form and this subspecies have been obtained together, but in nature *A. bipunctata revelierei* seems to live only in particular biotopes (I have collected it in Corsica (Monte Cinto) and Spain (Sierra Nevada) only at high altitudes), and is probably an ecological race. The male genitalia are scarcely diagnostic as in many species of *Adalia* Mulsant, 1846.

45. *Adalia (Adalia) decempunctata* (Linnaeus, 1758)

MATERIAL EXAMINED. **Cagliari prov.:** Burcei, dint. P.ta Serpeddì, 785 m, 13.XI.2006, MB GN MZ DW, oe, 1 ex (CNBFVR); Cagliari, CM, 4 ex (MCC); Cagliari, S. Bartolomeo, CM, 2 ex (MCC); dint. Capoterra, CM, 2 ex (MCC); Serri, 2.VI.2002, LF, 2 ex (CCSD); dint. Seulo, 743 m, 17.V.2008, GN PA MB MTr, sn, 2 ex (CNBFVR). **Carbonia-Iglesias prov.:** Domusnovas, sa Duchessa, 371 m, 19.IX–3.X.2006, GC, mt, 2 ex (CNBFVR); Fluminese, dint. Arcu Genna Bogai, 400 m, 5.IV.2004, GS SF, sn, 3 ex (CPC); Iglesias, dint. Case Marganai, 700 m, 12.XII.2003–8.I.2004, GC, mt, 1 ex (CNBFVR); Iglesias, dint. colonia Beneck, 636 m, 16–30.V.2006, GC, mt, 1 ex (CNBFVR); Iglesias, Marganai, plot CONECOFOR SAR1, 700 m, 16.II–15.VI.2004, DB PCe GN DW, mt, 2 ex (CNBFVR); 1–16.VIII.2004, GC, mt, 2 ex (CNBFVR); 1.III–29.IV.2005, GC, mt, 1 ex (CNBFVR); 29.IV–20.V.2005, GC, mt, 1 ex (CNBFVR); 20.V–16.VI.2005, GC, wt, 1 ex (CNBFVR); Iglesias, Marganai, Tintillonis, 480 m, 9.VI.2004, GN, sn, 1 ex (CNBFVR); Iglesias, Vecchia Cantoniera Marganai, 491 m, 9.VI.2004, GN, sn, 1 ex (CNBFVR); 20.III.2006, PCo, sn, 1 ex (CNBFVR). **Medio Campidano prov.:** Gonno-sfanàdiga, sa P.ta de s'Erbaceu, strada per Monte Linas, 744 m, 22.V.2006, PCo MB DB DW, sn, 1 ex (CNBFVR); Villacidro, rive Rio Cannisoni, 375 m, 24.III.2006, DB DW, nt, 1 ex (CNBFVR); Villacidro, Rio Cannisoni, 390 m, 20.V.2008, GN PA MB MTr, dc, 1 ex (CNBFVR). **Ogliastra prov.:** Gairo, dint. Monte Perda Liana, 1060 m, 16.V.2008, MB PA GN MTr, oe, 5 ex (CNBFVR); 16.V.2008, GN PA MB MTr, sn, 1 ex (CNBFVR); Gairo, Monte Perda Liana, 1219 m, 16.V.2008, GN PA MB MTr, sn, 2 ex (CNBFVR); Gairo, Monte Tonneri, dint. nuraghe Ardassai, 1020 m, 16.V.2008, MB GN PA MTr, oe on *Crataegus* sp., 1 ex (CNBFVR); Seui, dint. Monte Tonneri, Foresteria Montarbu, 867 m, 15.V.2008, GN PA MB MTr, sn,

1 ex (CNBFVR); Seui, dint. Monte Tonneri, sorg. Nuletta, 892 m, 17.V.2008, GN PA MB MTr, dc, 1 ex (CNBFVR). **Nuoro prov.:** [Baronia,] Siniscola, Capo Comino, VII.1998, LF, 1 ex (CCSD); Baronia, Siniscola, Capo Comino, spiaggia, 27.VI–3.VII.2004, PCo GS, sn, 1 ex (CPC); 14–19.VI.2007, PCo, dc, 1 ex (CPC); 20–29.VI.2007, PCo, dc, 1 ex (CPC); Baronia, Siniscola, Capo Comino, Foresta P. Su Arcu, 26.VI.2007, PCo GS, sn, 1 ex (CPC); Baronia, Siniscola, Monte Albo, 700–900 m, 22.VI.2007, PCo GS, sn, 3 ex (CPC); Gennargentu, Bruncu Spina, 1200–1500 m, 4.VII. 2004, PCo GS, sn, 1 ex (CPC). **Oristano prov.:** Oristano, CM, 4 ex (MCC); VI.1967, CM, 1 ex (CCSD). **Sassari prov.:** Gocèano, between Anela and Bultei, 500 m, 24.VI.2007, PCo GS, sn, 1 ex (CPC); Passo Limbara, Strada Statale 392, 650 m, 7.VII.2004, PCo GS, sn, 2 ex (CPC).

DISTRIBUTION. Europe, North Africa and western Asia.

NOTES. While *A. bipunctata* lives on grasses and shrubs, *A. decempunctata* is found mainly on trees.

46. *Tytthaspis sedecimpunctata* (Linnaeus, 1758)

DISTRIBUTION. Europe, northern Asia, and NW Africa.

NOTES. Prefers sandy places where it feeds on Erysiphaceae (Ascomycetes, Perisporiales). No Sardinian specimens were examined, but this species was collected by R. Gestro at San Vito (Cagliari prov.) (Della Beffa 1913).

47. *Coccinella (Coccinella) septempunctata* Linnaeus, 1758

MATERIAL EXAMINED. **Carbonia-Iglesias prov.:** Buggerru, foce Rio Mannu, dune, 13.VI.2004, GN DB PCe MT DW, nt, 1 ex (CNBFVR); Domusnovas, Bega d'Aleni, 621 m, 13.VII.2006, MB DA DB PCe DW, sn, 1 ex (CNBFVR); Domusnovas, sa Duchessa, 371 m, 16–30.V.2006, GC, mt, 1 ex (CNBFVR); 11–25.VII.2006, GC, mt, 1 ex (CNBFVR); Domusnovas, Valle Orida, 592 m, 16–30.V.2006, GC, mt, 5 ex (CNBFVR); 30.V–13.VI.2006, GC, mt, 1 ex (CNBFVR); 27.VI–11.VII.2006, GC, mt, 1 ex (CNBFVR); 8–22.VIII.2006, GC, mt, 1 ex (CNBFVR); Domusnovas, Valle Orida, 643 m, 7.VI.2004, GN, dc, 1 ex (CNBFVR); 7.VI.2004, GN, sn, edge of road, on graminaceae and compositae in shady places, 1 ex (CNBFVR); Iglesias, dint. Case Marganai, 650 m, 23.IX.2004, EG, dc, 1 ex (CNBFVR); Iglesias, Case Marganai, 725 m, 8.IX.2006, GN, under holm oak bark, 1 ex (CNBFVR); Iglesias, dint. colonia Beneck, 636 m, 16–30.V.2006, GC, mt, 2 ex (CNBFVR); 13–27.VI.2006, GC, mt, 2 ex (CNBFVR); Iglesias, dint. Conca Marganai, 674 m, 11.VI.2004, GN, dc, 1 ex (CNBFVR); Iglesias, Marganai, plot CONECOFOR SAR1, 700 m, 16.II–15.VI.2004, GC, mt,

4 ex (CNBFVR); 15–30.VI.2004, GC, wt, 1 ex (CNBFVR); 21.IX–6.X.2004, GC, mt, 1 ex (CNBFVR); 22.XI–17.XII.2004, GC, mt, 1 ex (CNBFVR); 1.III–29.IV.2005, GC, mt, 1 ex (CNBFVR); Iglesias, M.ti Marganai, Tintillonis, 480 m, 7.VI.2004, GN, dc, 1 ex (CNBFVR); Iglesias, Punta S. Michele, 906 m, 10.XI.2006, MB GN MZ DW, nt, 1 ex (CNBFVR); Sant'Antioco, Isola La Vacca, 26.VI.1987, VV, 1 ex (MCZR). **Medio Campidano prov.:** Gonnosfanàdiga, Monte Linas, Genna Mirratta (sorg.), 793 m, 12.IX.2006, GN, sn, 1 ex (CNBFVR); Gonnosfanàdiga, Monte Linas, Genna su Padenti, 853 m, 12.IX.2006, GN, nt, 1 ex (CNBFVR); Villacidro, rive Rio Cannisoni, 382 m, 25.III.2006, PCo, sn, 1 ex (CNBFVR). **Nuoro prov.:** Baronia, Siniscola, Monte Albo, 600–800 m, 8.VII.2001, PCo GS, sn, 1 ex (CPC); 30.VI.2004, PCo GS, sn, 3 ex (CPC); Baronia, Siniscola, Monte Albo, 700–900 m, 22.VI.2007, PCo GS, sn, 1 ex (CPC); Gennargentu, Bruncu Spina, 1200–1500 m, 4.VII.2004, PCo GS, sn, 1 ex (CPC); Macomer, VI.1957, L?, 5 ex (CCSD); Orgosolo, Oristillai, 947 m, 4.IX.2006, MB DA DB GN, oe on *Quercus ilex*, 1 ex (CNBFVR); 4.IX.2006, GN, dc, 1 ex (CNBFVR). **Ogliastra prov.:** Gairo, Monte Tonneri, dint. nuraghe Ardassai, 1020 m, 16.V.2008, MB GN PA MTr, oe on *Crataegus* sp. and *Quercus ilex*, 2 ex (CNBFVR). **Oristano prov.:** Oristano, 21.V.1960, L?, 1 ex (CCSD); 5.V.2003, MA, 1 ex (CNBFVR); Putzu Idu, 26.V.1998, CC, 2 ex (CCSD). **Sassari prov.:** Gocèano, loc. b'Uccaidu, 1040 m, 24.VI.2007, PCo GS, sn, 3 ex (CPC).

DISTRIBUTION. Palaearctic Region (China and Japan included), India, Bangladesh, imported in the USA.

NOTES. Common everywhere, feeding principally on aphids, thrips, Aleyrodidae, Psyllidae and Cicadellidae (Homoptera), Chrysomelidae (Coleoptera), but also on pollens and nectars.

48. *Coccinella (Spilota) undecimpunctata undecimpunctata* Linnaeus 1758

MATERIAL EXAMINED. **Cagliari prov.:** Cagliari, CM, 7 ex (MCC); dint. Capoterra, CM, 8 ex (MCC); Chia, CM, 1 ex (MCC); Giorgino, 6.VI.1973, CM, 1 ex (MCC); Quartu Sant'Elena, CM, 3 ex (MCC); Villaspeciosa, CM, 2 ex (MCC). **Medio Campidano prov.:** Arbus, Piscinas, 0 m, 25.V.2006, MB DB PCo DW, sn, 1 ex (CNBFVR). **Oristano prov.:** Assemini, CM, 3 ex (MCC); Putzu Idu, 26.V.1998, CC, 1 ex (CCSD).

DISTRIBUTION. The nominal subspecies lives in Europe; subspecies *menetriesi* Mulsant, 1850 on Pantelleria Island (Sicily), in the Middle East, North Africa, Arabia, Iran, Iraq, Afghanistan and central Asia.

NOTES. An aphidophagous species, found mainly on salty grounds.

49. *Coccinula quatuordecimpustulata* (Linnaeus, 1758)

DISTRIBUTION. Central, western and southern Europe, Morocco, Madeira, central Asia, China (Sin-Kiang) and Siberia.

NOTES. It was recorded from Ozieri (Sassari prov.) by Della Beffa (1913) on the basis of material housed in the Florence Zoological Museum, but I have never observed Sardinian specimens of this species, otherwise common in all of Italy.

50. *Oenopia conglobata conglobata* (Linnaeus, 1758)

DISTRIBUTION. Europe and Asia.

NOTES. Specimens from Sorgono (Nuoro prov.) collected by A. Krausse were cited by Della Beffa (1913), but after that no other specimen has been recorded from Sardinia.

51. *Oenopia doublieri* (Mulsant, 1846)

MATERIAL EXAMINED. **Cagliari prov.:** Capoterra, X.1978, PL, 2 ex (CCSD); Maracalagonis, stagno, 21.V.1975, CM; 1 ex (CCSD). **Carbonia-Iglesias prov.:** Sant'Antioco, wdc, L?, 3 ex (EISS). **Oristano prov.:** Oristano, wdc, L?, 3 ex (EISS); VI.1957, L?, 1 ex (CCSD); Oristano, Fiume Tirso, CM, 3 ex (MCC). **Sassari prov.:** Alghero, wdc, L?, 2 ex (EISS); Sassari, Stagno di Pilo, 18.V.1974, VR, 1 ex (CCSD).

DISTRIBUTION. Mediterranean Region.

NOTES. It lives on *Tamarix* sp.

52. *Oenopia lyncea lyncea* (A.G. Olivier, 1808)

MATERIAL EXAMINED. **Cagliari prov.:** Chia, CM, 2 ex (MCC); dint. Seulo, 743 m, 17.V.2008, GN PA MB MTr, sn, 1 ex (CNBFVR). **Carbonia-Iglesias prov.:** Domusnovas, P.ta Piloni de Sa Figu, 750 m, 11.IX.2006, MB DA DB GN, oe on *Quercus ilex* and *Arbutus unedo*, 1 ex (CNBFVR); Iglesias, dint. colonia Beneck, 636 m, 18.IV–2.V.2006, GC, mt, 1 ex (CNBFVR); 2–16.V.2006, GC, mt, 1 ex (CNBFVR); 16–30.V.2006, GC, mt, 1 ex (CNBFVR); Iglesias, Marganai, plot CONECOFOR SAR1, 700 m, 16.II–15.VI.2004, DB PCe GN DW, mt, 1 ex (CNBFVR); 22.XI–17.XII.2004, GC, mt, 1 ex (CNBFVR); 1.III–29.IV.2005, GC, mt, 1 ex (CNBFVR); Iglesias, M.ti Marganai, Tintillonis, 480 m, 7.VI.2004, GN, dc, 1 ex (CNBFVR). **Medio Campidano prov.:** Villacidro, rive Rio Cannisoni, 382 m, PCo, sn, 1 ex (CNBFVR); Villacidro, Rio Cannisoni, radura riva sinistra, 401 m, 19–24.V.2006, MB DB PCo DW, lt, 1 ex (CNBFVR). **Nuoro prov.:** Oliena, loc. Monte Maggione, 624 m, 4.IX.2006, GN, sn, 1 ex (CNBFVR). **Ogliastra prov.:** Gairo, Monte Tonneri, dint. nuraghe Ardassai, 1020 m, 16.V.2008, MB GN PA MTr, oe on *Crataegus* sp. and *Quercus ilex*, 1 ex (CNBFVR). **Olbia-Tempio prov.:** Tempio Pausania, wdc, L?, 1 ex (EISS).

DISTRIBUTION. The nominal subspecies occurs in the western Mediterranean Region, while *O. lyncea agnatha* (Rosenhauer, 1847) lives in central Europe, the eastern Mediterranean region and Turkey.

NOTES. *O. l. lyncea* lives on evergreen oaks (*Quercus suber* and *Q. ilex*), while *O. l. agnatha* lives on deciduous oaks.

53. *Harmonia quadripunctata* (Pontoppidan, 1763)

MATERIAL EXAMINED. **Carbonia-Iglesias prov.:** Iglesias, Marganai, CONECOFOR plot SAR1, 700 m, 16.II–15.VI.2004, DB PCe GN DW, mt, 1 ex (CNBFVR). **Nuoro prov.:** Baronia, Siniscola, Capo Comino, spiaggia, 14–19.VI.2007, PCo, dc, 1 ex (CPC). **Oristano prov.:** Putzu Idu, 26.V.1998, CC, 2 ex (CCSD). **Sassari prov.:** La Nurra, Porto Ferro, 4.VII.1999, PCo GS, dc back beach, 1 ex (CPC); Sorso, wdc, L?, 1 ex (EISS).

DISTRIBUTION. Europe, Asia (Siberia included), the Oriental Region and North America.

NOTES. Lives on firs.

54. *Halysia sedecimguttata* (Linnaeus, 1758)

DISTRIBUTION. Palaearctic Region.

NOTES. Like all members of the subfamily Psylloborinae, it feeds on Erysiphaceae. It was recorded from Sorgono (Nuoro prov.) by Della Beffa (1913) based on material collected by A. Krausse.

55. *Vibidia duodecimguttata* (Poda, 1761)

DISTRIBUTION. Palaearctic Region, China and Japan included.

NOTES. Recorded by Della Beffa (1913) from Asuni (Cagliari prov.) and Sorgono (Nuoro prov.). It feeds on mycomycetes: *Sphaerotheca pannosa* (Perisporiales, Erysiphaceae) (Iablokoff-Khnzorian 1982).

56. *Myrrha octodecimguttata formosa* (A. Costa, 1849)

MATERIAL EXAMINED. **Cagliari prov.:** Cagliari, CM, 4 ex (MCC). **Medio Campidano prov.:** Villacidro, CM, 3 ex (MCC). **Nuoro prov.:** Santa Lucia, 15–30.V.1979, RC, 1 ex (CCSD). **Oristano prov.:** Ula Tirso, CM, 1 ex (MCC); Terralba, stagno di Marceddi, 0 m, 25.V.2006, PCo MB DB DW, sn, 1 ex (CNBFVR).

DISTRIBUTION. Europe and Palaearctic Asia; the above-mentioned subspecies lives in western Europe (cf. Canepari 2007).

NOTES. Della Beffa (1913) recorded it also from Golfo Aranci (Olbia-Tempio prov.). Kovář (2007) considers *formosa* as a synonym of *octodecimguttata*

(Linnaeus, 1758). As rightly observed by Sainte-Claire Deville (1914), the subspecies *formosa* is a true biological race living on southern species of the genus *Pinus* (*P. pinaster*, *P. nigra*, *P. halepensis*), while the nominal subspecies lives on *P. sylvestre*.

57. *Calvia quatuordecimguttata* (Linnaeus, 1758)

DISTRIBUTION. Holarctic Region.

NOTES. Species living on trees. In North America and Palearctic Asia the colour of the elytra varies, while in Europe it is uniform pale yellow with seven pairs of white spots. I have never examined Sardinian specimens of this species, but Della Beffa (1913) reported it as collected at Sorgono (Nuoro prov.) by A. Krausse.

58. *Propylea quatuordecimpunctata* (Linnaeus, 1758)

MATERIAL EXAMINED. **Cagliari prov.:** Cagliari, CM, 7 ex (MCC); dint. Capoterra, CM, 2 ex (MCC); Quartu Sant'Elena, CM, 3 ex (MCC). **Carbonia-Iglesias prov.:** Buggerru, foce Rio Mannu, dune, 14.VI.2004, GN DB PCe MT DW, nt, 1 ex (CNBFVR). **Nuoro prov.:** Aritzo, CM, 5 ex (MCC); Belvi, CM, 2 ex (MCC); Gocèano, Anela, Foresta Demaniale, 500 m, 24.VI.2007, PCo GS, sn, 1 ex (CPC). **Ogliastra prov.:** Seui, dint. Monte Tonneri, Sa ucca 'e su Oe, 912 m, 5.IX.2006, MB DA DB GN, dc, 1 ex (CNBFVR). **Oristano prov.:** Oristano, CM, 3 ex (MCC).

DISTRIBUTION. Palearctic Region (Japan included), imported in the USA.

NOTES. An aphidiphagous species living on grasses, leguminous plants and potatoes. It is one of the most common Coccinellidae in western Europe (cf. Canepari 2007).

59. *Psyllobora vigintiduopunctata* (Linnaeus, 1758)

MATERIAL EXAMINED. **Cagliari prov.:** Cagliari, CM, 2 ex (MCC); Capoterra (CA), X.1978, PL, 1 ex (CCSD). **Oristano prov.:** Oristano, VI.1967, L?, 1 ex, (CCSD). **Sassari prov.:** Alghero, 7.V.1959, L?, 1 ex, (CCSD); Gocèano, between Anela and Bultei, 500 m, 24.VI.2007, PCo GS, sn, 1 ex (CPC); Isola dell'Asinara, Cala d'Arena, 1.VII.1987, VV, 1 ex (MCZR); Stagno di Pilo, 11.VIII.1978, MP, 1 ex (CCSD).

DISTRIBUTION. Palearctic Region, excluding the northern part.

NOTES. A mycetophagous species that feeds on Erysiphaceae, particularly of the genus *Sphaerotheca*. Della Beffa (1913) recorded it from five Sardinian localities: Asuni, Decimomannu, San Vito, Sarrabus and Sorgono.

60. *Henosepilachna argus* (Geoffroy, 1762)

MATERIAL EXAMINED. **Oristano prov.:** Bosa, wdc, L?, 2 ex (EISS); Seneghe, wdc, L?, 1 ex (EISS).

DISTRIBUTION. Southern and western Europe.

NOTES. Della Beffa (1913) recorded it also from Ozieri (Sassari prov.) on the basis of specimens from the Dodero collection (MCSG). It lives on Cucurbitaceae (*Bryonia*, *Ecballium*, *Cucumis*, etc.).

61. *Henosepilachna elaterii elaterii* (Rossi, 1794)

MATERIAL EXAMINED. **Cagliari prov.:** Stagno di Molentargius, 1.VI.1996, LF, 4 ex (CCSD). **Medio Campidano prov.:** Barumini, 16.VIII.1959, L?, 6 ex (EISS; CCSD). **Oristano prov.:** Cabras, wdc, L?, 1 ex (EISS); Oristano, wdc, L?, 3 ex (EISS). **Sassari prov.:** Alghero, wdc, L?, 1 ex (EISS); Nulvi, wdc, L?, 2 ex (EISS); Porto Torres, wdc, L?, 3 ex (EISS); Sassari, wdc, L?, 2 ex (EISS).

DISTRIBUTION. The nominal subspecies lives in central and southern Europe and in western Asia. Many subspecies were described (cf. Fürsch 1964) according to habitus shape and elytral spots dimensions: *H. e. portugalis* Fürsch, 1964 (Mallorca and Portugal), *H. e. orientalis*, Zimmermann, 1936 (Egypt, Palestine, Jordan and Cyprus) and *H. e. voltaensis* Fürsch, 1964 (Tchad, Niger and Senegal).

NOTES. Lives on Cucurbitaceae.

62. *Subcoccinella vigintiquatuorpunctata* (Linnaeus, 1758)

MATERIAL EXAMINED. **Nuoro prov.:** Sarule, Monte Gonare, 10.V.2003, LF, 2 ex (CCSD).

DISTRIBUTION. Palearctic Region.

NOTES. Species apparently rare in Sardinia, that feeds on Leguminosae (*Saponaria*, *Medicago*).

DISCUSSION

The Sardinian fauna of Coccinellidae includes with certainty 62 species. As expected, most of the species are widespread in the western Mediterranean Region. *Scymnus* (*S.*) *damryi* is known from Sardinia, Corsica and Elba Island, but no species are endemic of Sardinia. Interesting from a zoogeographical point of view are also some species which occur, other than in Sardinia, in a few other regions only: *Nephus* (*N.*) *peyerimhoffi* in North Africa and the Canary Islands, *Hyperaspis algerica* in Maghreb and France, and *Scym-*

niscus semirufus in Corsica, the Italian mainland, Dalmatia and Turkey. This last species is rare in other countries while it is commonly found in Sardinia.

The records from Sardinia (cf. Audisio et al. 1995; Canepari 2004) of *Hyperaspis chevrolati* Canepari, 1985, *H. concolor* Suffrian, 1843, *H. reppensis reppensis* (Herbst, 1783), *Coccinella* (*Coccinella*) *magnifica* Redtenbacher, 1843, and *Scymnus* (*Mimopullus*) *pharaonis*, Motschulsky, 1851 (= *S. araraticus* Iablokoff-Khnzorian, 1969) are erroneous, and these species must be excluded from the fauna of this island. However, they occur in the facing Tuscan Archipelago: *H. chevrolati* on Giglio Island (CCSD: VIII.1957, AS, 1 ex), *H. concolor* on Elba Island (Canepari et al. 1985), *H. reppensis reppensis* on Elba Island (Luigioni 1929), *Coccinella* (*C.*) *magnifica* on Elba Island (Luigioni 1929), and *Scymnus* (*Mimopullus*) *pharaonis* on Giglio Island (CFF: IV.1985, AFo, 5 ex).

Scymnus (*Mimopullus*) *fulvicollis* (Mulsant, 1846), *S.* (*Neopullus*) *limbatus limbatus* (Stephens, 1831), *Hyperaspis hoffmannseggii* (Gravenhorst, 1807), *Tytthaspis phalerata* (A. Costa, 1849) and *Calvia decemguttata* (Linnaeus, 1758) were quoted from Sardinia by Bertolini (1876). These records were later reported also by Luigioni (1929), who also recorded the following additional species from Sardinia: *Scymnus* (*N.*)

haemorrhoidalis (Herbst, 1797), *Scymniscus tristiculus* (Weise, 1929), *Chilocorus similis* (Rossi, 1790), *Exochomus nigromaculatus* (Goeze, 1777), *Coccidula rufa* (Herbst, 1783), *Oenopia lyncea agnata* (Rosenhauser, 1847), *Halyzia sedecimguttata* (Linnaeus, 1758) and *Myrrha octodecimguttata octodecimguttata* (Linnaeus, 1758). All of these thirteen species, during eighty years of subsequent researches, were not found and are very probably absent in Sardinia. Also absent on the island is *Nephus* (*Nephus*) *reunioni* Fürsch, 1974, which was introduced there for biological control of *Planococcus citri* (Risso, 1813) (Hemiptera, Pseudococcidae) (cf. Ortu & Prota 1983; Luciano et al. 1996; Roy & Migeon 2010) but does not seem to have become acclimatized (Canepari 2004; Kovár 2007).

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