TÜBİTAK

Turkish Journal of Zoology

http://journals.tubitak.gov.tr/zoology/

Research Article

Turk J Zool
(2015) 39: 314-322
© TÜBİTAK
doi:10.3906/zoo-1402-27

New data on distribution, ecology, and taxonomy of Turkish Nitidulidae (Coleoptera)

Sakine Serap AVGIN[1,2,*], Gloria ANTONINI[3], Andrzej LASOŃ[4], Nicklas JANSSON[5], Tuba ÖNCÜL ABACIGİL[6], Sakin Vural VARLI[7], Alessio DE BIASE[3], Paolo AUDISIO[3]

[1]Division of Science Education, Faculty of Education, Kahramanmaraş Sütçü İmam University, Avşar Campus, Kahramanmaraş, Turkey
[2]Department of Biology, Faculty of Arts and Sciences, Kahramanmaraş Sütçü İmam University, Avşar Campus, Kahramanmaraş, Turkey
[3]Department of Animal and Human Biology, Sapienza University of Rome, Rome, Italy
[4]ul. Wiejska 4b/85, Bialystok, Poland
[5]Division of Ecology, Linköping University, Linköping, Sweden
[6]Department of Olive and Olive Processing Technology, Edremit Vocational High School, Balıkesir University, Edremit, Balıkesir, Turkey
[7]Department of Biology, Faculty of Arts and Sciences, Balıkesir University, Balıkesir, Turkey

Received: 13.02.2014 • **Accepted:** 17.05.2014 • **Published Online:** 27.02.2015 • **Printed:** 27.03.2015

Abstract: This paper updates our present knowledge on the geographical distribution and host plant relationships of Turkish species of the sap- and pollen-beetle family Nitidulidae. *Pria zenobia* Jelínek, 1997 from eastern Mediterranean areas is synonymized with *Pria angustula* Cooper, 1982, from South Africa (**syn. nov.**). The unknown ovipositor of *Xerogethes osellai* Audisio & Jelínek, 2000, a species endemic to central Turkey, is described, and the first information on its biology is reported. *Glischrochilus quadripunctatus* (Linnaeus, 1758) (Tunceli Province) and *Pityophagus quercus* Reitter, 1877 (Balikesir Province) are first recorded for the Turkish fauna. The distributions of *Glischrochilus hortensis* (Geoffroy in Fourcroy, 1785), *Soronia grisea* (Linnaeus, 1758), *Brassicogethes cristofaroi* (Audisio & De Biase, 2005), *Stachygethes zarudnyi* (Kirejtshuk, 1984), *S. assimilis* (Sturm, 1845), *Sagittogethes biondii* (Audisio, 1988), and *S. hoffmanni* (Reitter, 1871) are updated. The previously unknown larval host plants of other Turkish and Balkan Meligethinae are identified, and *Clypeogethes chlorocyaneus* (Jelínek & Audisio, 1977) is first reported from Greece. Finally, a new updated checklist of the Turkish Nitidulidae is presented.

Key words: Coleoptera, Nitidulidae, Turkey, geographical distribution, host plants, new synonymy, checklist

1. Introduction

The Turkish Nitidulidae have been extensively discussed by Audisio (1993b) and more recently by Audisio et al. (2000), wherein a comprehensive annotated list of Nitidulidae from the Near East was presented. Additional data on new or poorly known Turkish species were later reported by Audisio and Jelínek (2005–2013), Audisio et al. (2001a, 2001b, 2002, 2005a, 2005b, 2006, 2011, 2012), Lasoń (2007), Jelínek and Audisio (2007), De Biase et al. (2012), and Avgin et al. (2012). Finally, several important nomenclatorial and taxonomic changes have been recently introduced in Nitidulidae systematics, chiefly in the subfamily Meligethinae (Audisio et al., 2009; Jelínek and Audisio, 2009; Rutanen et al., 2010), thus rendering the list of Audisio et al. (2000) out of date. Recent proposals on Meligethinae taxonomy introduced by Kirejtshuk and Kirejtshuk (2012) have been ignored, as these emendations mostly represent anecdotal considerations as discussed by Audisio et al. (2014). The present paper is mainly intended to update our knowledge on the geographical distribution, ecology, and taxonomy of this beetle family in Turkey, listing and reporting a short series of data mainly collected during recent fieldtrips to eastern and western Turkey. The present contribution also includes an updated checklist of the Nitidulidae of Turkey, currently comprising 162 species, with 17 species represented by more or less recently introduced and acclimatized taxa. For a useful comparison, the updated Iranian checklist recently published by Lasoń and Ghahari (2013) includes 84 species, suggesting that the Turkish sap- and pollen-beetle fauna may be better explored and known than the Iranian fauna. However, the Iranian fauna may include a large number of important novelties, but specialized field studies are needed to fully discern the fauna in that country.

2. Materials and methods

Approximately 200 specimens of Turkish Nitidulidae were collected with pitfall and arboreal traps baited with

* Correspondence: ssavgin@ksu.edu.tr

beer, in rotten wood, and by handpicking and sweep-netting on flowering plants. Collected material was dried in entomological boxes or preserved in 75% ethanol. The collections listed below serve as the voucher institutions.

2.1. Acronyms of the studied collections

CAR: P. Audisio Collection, Zoological Museum of Sapienza University of Rome, Rome, Italy.

CLB: A. Lasoń Collection, Bialystok, Poland.

DBUBT: Collections of the Department of Biology, Faculty of Arts and Science, University of Balıkesir, Turkey

EMET: Entomological collections, Faculty of Agriculture, Atatürk University, Erzurum, Turkey.

NJC: Coll. N. Jansson, Linköping, Sweden.

NMP: National Museum (Entomology), Prague, Czech Republic.

3. Results and discussion

Specimens belonging to the following 12 species of Turkish Nitidulidae were examined.

NITIDULIDAE

***Glischrochilus quadripunctatus* (Linnaeus, 1758)**

Examined material: TURKEY, Tunceli Province, Karaoğlan Mts., pass between Hozat and Ovacık, ca. 15 km S of Ovacık, 39°14′37″N, 39°12′51″E, 2005 m a.s.l., 23.vi.2013, P. Rapuzzi, M.A. Bologna & P. Audisio leg., 1 ♀, in mixed broadleaved and coniferous (*Abies*) tree forest, in aerial traps baited with beer (placed by I. Rapuzzi at the beginning of June 2013; CAR).

This uncommon but widespread Euro-Siberian species was previously known in Anatolian and Caucasian areas from the Russian Caucasus, Circassia (Reitter, 1888; Audisio et al., 2000). New species for Turkey.

***Glischrochilus hortensis* (Geoffroy in Fourcroy, 1785)**

Examined material: TURKEY, Tunceli Province, Karaoğlan Mts., pass between Hozat and Ovacık, ca. 15 km S of Ovacık, 39°14′37″N, 39°12′51″E, 2005 m a.s.l., 23.vi.2013, P. Rapuzzi, M.A. Bologna & P. Audisio leg., 4 ♂♂, 3 ♀♀, in mixed broadleaved and coniferous tree forest, in aerial traps baited with beer (placed by I. Rapuzzi at the beginning of June 2013; CAR).

This widespread Euro-Siberian species was previously recorded from Turkey only from Artvin Province (Audisio et al., 2000).

***Pityophagus quercus* Reitter, 1877 in Putzeys, Reitter, Saulcy & Weise, 1877**

Examined material: TURKEY, Balikesir Province, 10 km N of Edremit, Ida Mountain, Ayi stream, 39°41′17″N, 26°56′15″E, ca. 600 m a.s.l., window trap 5, on old hollow oak (*Quercus frainetto* Ten.), 15.vi.2011, T. Oncul, S. Varli & N. Jansson leg., 1 ♂, 1 ♀ (NJC, CAR).

This widespread but rare eastern and southern European taxon, strictly associated with old-growth oak forests, was known thus far from Greece, Hungary, Bulgaria, NE Romania, Czech Republic, Slovakia, S Poland, Bosnia-Herzegovina, Macedonia, central Italy, S France, and N Spain (Ganglbauer, 1899; Audisio et al., 2011; Barnouin et al., 2011). New species for Turkey and for Asia.

***Soronia grisea* (Linnaeus, 1758)**

Examined material: TURKEY, Tunceli Province, Karaoğlan Mts., pass between Hozat and Ovacık, ca. 15 km S of Ovacık, 39°14′37″N, 39°12′51″E, 2005 m a.s.l., 23.vi.2013, P. Rapuzzi, M.A. Bologna & P. Audisio leg., 3 ♂♂, 4 ♀♀, in mixed broadleaved and coniferous tree forest, in aerial traps baited with beer (placed by I. Rapuzzi at the beginning of June 2013; CAR).

This widespread Euro-Asiatic species was only recently recorded from Turkey (European Turkey, Kırklareli Province: Lasoń, 2007). New species for Asiatic Turkey.

***Pria zenobia* Jelínek, 1997**

This recently described rare and peculiar eastern Mediterranean taxon was known from SE Turkey (Mersin Province), Israel, and W Greece (Audisio et al., 2000). In his original description, Jelínek (1997) correctly highlighted the close relationships of this taxon with members of a small species-group of *Pria* known to occur in southern and eastern Africa, and specifically with the poorly known *P. angustula* Cooper, 1982 that was described from the Cape Region (Cooper, 1982) but is known to occur in several coastal areas of SW and SE Africa. Reexamination of the type material of *Pria angustula* by author PA in BMNH and of some specimens of *P. zenobia* from Greece and Turkey (CAR, NMP) allowed us to recognize that *Pria zenobia* and *P. angustula* are actually hard to separate on a morphological basis, despite the enormous distance of their respective geographic ranges. This evidence led PA to obtain more insights on the geographical distribution and ecology of *P. angustula*. Recent fieldtrips to South Africa (2003, 2008, 2009, 2012) allowed PA to collect a relatively long series of *Pria angustula* in several localities of South Africa, from the Western Cape Province to the northern Mpumalanga, close to the Mozambique border. All specimens were collected in a single type of environment, i.e. coastal freshwater or salt marsh lagoons, or river mouths bordered by sandy habitat vegetation dominated by *Tamarix* spp. (Tamaricaceae), a vegetation type that is widespread in most of the coastal sandy wetlands of southern and eastern Africa, the Arabian Peninsula, the Near East, and North Africa.

The true larval host plant of *Pria angustula* was not identified thus far, but this unknown plant species is almost certainly associated with this type of environment, nearly the same that characterizes the few cited Palearctic localities of *Pria zenobia* in Turkey, Greece, and Israel (Jelínek, 1997; Audisio et al., 2000). We can thus propose that a single species of African origin spread in conjunction

with its larval host plant into East Mediterranean wetland areas throughout the southern and eastern coasts of Africa and/or the western Arabian Peninsula. No molecular data are thus far available to date this process, but it likely occurred more recently (late Pliocene/early Pleistocene?) than other South African/Mediterranean connections previously analyzed by molecular dating, e.g., in the genus *Afrogethes* Audisio & Cline, 2009 (Audisio et al., 2008; Bologna et al., 2008).

Pending molecular analyses aimed to estimate genetic distances between South African and E Mediterranean populations of *Pria angustula* and *P. zenobia* and considering the morphological similarities of the 2 populations, we introduce the following new synonymy: *P. zenobia* Jelínek, 1997 = *P. angustula* Cooper, 1982, **syn. nov.**

***Brassicogethes cristofaroi* (Audisio & De Biase, 2005) in Audisio, De Biase, Antonini, Mancini, Özbek & Gultekin, 2005**

Examined material: TURKEY, Gümüşhane Province, Köse Mountains, Köse Pass between Köse and Gümüşhane, 40°16′14″N, 39°37′40″E, 1700 m a.s.l, 23.vi.2013, rocky slope, on flowering *Rosa* sp. (Rosaceae), P. Audisio leg., 1 ♂ (CAR).

This endemic Turkish species was known thus far from 4 specimens of both sexes that were collected a few years ago in southern central Turkey on the Ala Mountains, near Çamardı (Niğde Province: Audisio et. al., 2005b). The new record above from the southern slope of the eastern portion of the Pontic Chain widely extends northwards and eastwards the known geographic range of this rare species. The larvae develop on *Arabis* cf. *caucasica* (Brassicaceae), and are active on flowers of this host plant in early May (Audisio et. al., 2005b).

***Clypeogethes wittmeri* (Jelínek & Audisio, 1977)**

Examined material: TURKEY, Erzincan Province, road Erzincan-İliç, ca. 20 km S of Kemah, 39°36′64″N, 38°45′76″E, 1300 m a.s.l., 12.v.2000, 9 exx. and 5 associated larvae, on *Hesperis* sp. cf. *bicuspidata* (Wild) Poiret (Brassicaceae), P. Audisio & E. Colonnelli leg. (CAR).

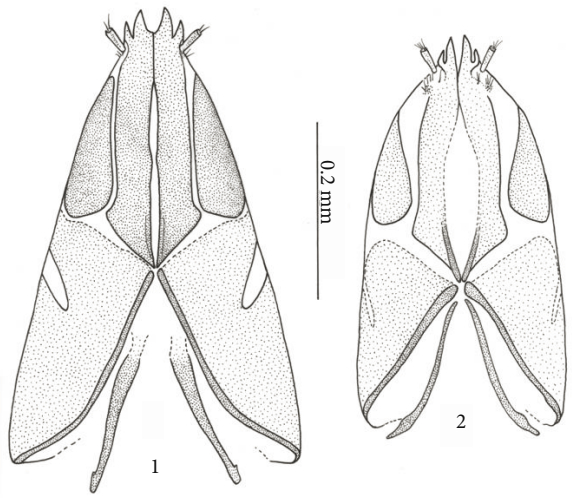
The larval host plants of this rare subendemic Turkish species, known thus far from Armenia and northeastern Turkey (Gümüşhane, Erzurum, Erzincan, and Sivas provinces), were not known with certainty (Audisio et al., 2000). The above listed record shows that *Clypeogethes wittmeri* is associated as larvae with members of the genus *Hesperis* (Brassicaceae, tribe Hesperideae), a specialization partially shared with the closely related and allopatric *C. coerulescens* (Kraatz, 1858) from Greece. Recent material (Audisio, unpublished data) from 3 Greek localities (Athene area and Taigetos mountains) was found on *Matthiola sinuata* (L.) W.T.Aiton, which belongs to the same botanical tribe. Interestingly, the other 2 members of the *C. coerulescens* species-complex [*C. chlorocyaneus* (Jelínek & Audisio, 1977) from the Balkans and Alps, and *C. tener* (Reitter, 1871) from southern Italy, Balkans, and Anatolia: Jelínek and Audisio, 1977] are both associated with Brassicaceae of the unrelated tribe Alysseae. *Clypeogethes tener* is associated with yellow-flowering *Alyssum* spp. throughout its wide geographic range (Audisio, 1993; Audisio et al., 2000), and *C. chlorocyaneus* with the white-flowering *Phyllolepidum cyclocarpum* (Boiss.) [olim *Ptilotrichum cyclocarpum* Boiss.: Cecchi, 2011] in NW Greece, Katara Pass, W slope, 1700 m a.s.l., 2.vi.2007, A. De Biase leg. (new species for Greece). The latter species, originally described from the Italian western Alps (Stura d'Ala Valley close to Turin: Jelínek & Audisio, 1977), was never collected on its true and locally unknown larval host plant at the type locality (Audisio, 1993), but may be associated with the rare *Hormathophylla halimifolia* (Boiss.) P.Küpfer [= *Alyssum halimifolium* L.; = *Ptilotrichum halimifolium* (L.) Boiss], or by other less closely related Alysseae. However, *Hormathophylla halimifolia* is the only known white-flowering member of the *Alyssum*-complex of genera in the W Alps.

***Xerogethes osellai* (Audisio & Jelínek, 2000)**

Examined material: TURKEY, Nevşehir Province, ca. 13 km ENE of Avanos, and ca. 2 km S of Bozca, road 300-16 between Avanos and Kayseri, 38°44′29″N, 35°00′06″E, 1030 m a.s.l, 20.vi.2004, P. Audisio leg., 4 ♂♂, 4 ♀♀, on an unidentified low-rise *Salvia* sp. (Lamiaceae) with small bluish flowers (CAR, NMP).

This species was described based on a single male specimen collected several years ago near Yozgat (Audisio et al., 2000). Despite a series of field researches made in different spring and summer months at the type locality (ca. 10 km E of Yozgat, 20.vi.1986), no new material was found until recent years. During a fieldtrip (vi.2004) to central Turkey (Cappadocia), a short series of *X. osellai* was collected in the above reported locality not far from Ürgüp and Avanos, where specimens of both sexes were found, allowing the description of the unknown female genitalia (ovipositor) of this taxon (Figures 1 and 2). The ovipositor of *X. osellai* clearly differs from that of the closely related, widespread, and syntopic *X. kraatzii* by the markedly narrower and much more acute (at base) distal forked excision, which is typical of all known species of *Xerogethes* (Figures 1 and 2). In the latter species, this excision is markedly wider and nearly U-shaped. Additionally, the "central point" in *X. osellai* is placed slightly more proximad than two-fifths of its total length, while in *X. kraatzii* it is placed slightly more proximad than the middle (Figures 1 and 2).

The biology and natural history of *X. osellai* were previously unknown. This species is one of the rarest Nitidulidae of the Euro-Mediterranean fauna and appears



Figures 1 and 2. Ovipositors of *Xerogethes kraatzii* (Reitter, 1871) (**Figure 1**) and of *X. osellai* Audisio & Jelínek, 2000 (**Figure 2**); female specimens of both species collected ca. 2 km S of Bozca (Turkey, Nevşehir Province).

to be associated with suberemic biota. The locality near Bozca and Avanos where the species was collected is represented by a peculiar 'sand dune-like' xeric landscape (Figure 3) formed by compact whitish cones (each cone nearly 40–50 m tall, with poor xerophytic vegetation) formed from light colored solidified lava streams, ash, and tuff stone, which all date from the Neocene period following some millions years of heavy meteoric water and aeolian erosion. All collected specimens were found on a single small plant of *Salvia* sp. with bluish flowers (no more than 15 cm tall) growing on the top of a cone. This single *Salvia* was the only visible plant in flower at the collecting site and obviously does not represent the true larval host plant of *X. osellai* (all *Xerogethes* are strictly associated with Brassicaceae: Audisio et al., 2009). As postulated by Audisio et al. (2000), this species should be associated with a suberemic species of Brassicaceae that may flower in full summer (possibly late July–August), which is an atypical flowering season for most plants inhabiting these peculiar and fragile environments. However, 2 subsequent efforts to collect other specimens of *X. osellai* from the above cited Cappadocian locality in July (2009, 2013) failed, confirming the exceptional rarity and elusive life-style of this species, further hindering the identification of its true larval host plant.

Figure 3. A 'sand-dunes'-like landscape, ca. 2 km S of Bozca (Nevşehir Province), where *Xerogethes osellai* (Audisio & Jelínek, 2000) was found.

***Stachygethes assimilis* (Sturm, 1845)**

This species was cited by Audisio et al. (2000) from 2 localities in Turkey (Kırklareli and Malatya provinces). Recent revision of the studied material allowed for discovery that the latter record (Malatya Province, Eskymalatya, v.1984, P. Audisio leg.) was based on a misidentification, and this widespread European species remains thus known only from European Turkey.

***Stachygethes zarudnyi* (Kirejtshuk, 1984)**

Examined material: TURKEY, Adıyaman Province, E of the village of Fidanlık, 800 m a.s.l., 11.v.2002, H. Özbek leg., 1 specimen (EMET).

This rare species, also distributed in N Iran (Kirejtshuk, 1984), was previously known from 2 localities in SE Turkey (Siirt and Van provinces: Audisio et al., 2000).

***Sagittogethes biondii* (Audisio, 1988)**

Examined material: TURKEY, Erzurum Province, road Erzurum-Narman, Kireçli Pass, 40°13′N, 41°43′E, 2400 m a.s.l., 9.vi.2001, 2 exx., on *Salvia staminaea* Motbret & Aucher, G. Antonini leg. (CAR); TURKEY, Tunceli Province, 22 km NE of Tunceli, Pülümür Çayı Valley, 6.x.2011, A. Lasoń leg., 5 exx., on *Salvia* sp. (CLB).

This rare endemic Turkish species, associated as larvae with *Salvia staminaea*, was known thus far only from the type locality in Ağrı Province (Tahir Pass, 2300 m a.s.l.; Audisio, 1988; Audisio et al., 2000).

***Sagittogethes hoffmanni* (Reitter, 1871)**

Examined material: TURKEY, Aksaray Province, southern edge of Tuz Gölü, ca. 5 km SE of Eskil, 38°23′23″N, 33°31′05″E, 900 m a.s.l., 2.vii.2013, P. Audisio leg., wetland, on flowering plants of *Teucrium scordium* L. (Lamiaceae), 16 ♂♂, 22 ♀♀ (CAR).

This widespread but rare Palearctic species, markedly threatened in most of its western geographic range due to the destruction of favorable habitats (low-altitude wetlands surrounded by steppic and parasteppic formations) in Turkey, was known from Konya, Adıyaman, and Tunceli provinces (Jelínek, 1967; Audisio et al., 2000; Lasoń, 2007). This is the first time that this species was collected in number on its usually rare and elusive larval host plant (Audisio, 1993b).

3.1. Checklist of Turkish Nitidulidae

Synonyms are indicated only when the nomenclatorial situation of the involved species changed recently, after the publication of Audisio's (1993b) monograph.

Subfamilies are listed in systematic order; within each subfamily, genera are listed in systematic order, while species are listed alphabetically within each genus.

Genera and species whose (possible) presence in Turkey has not been documented are between square brackets.

Refer to Jelínek and Audisio (2007) for geographic distribution and synonyms of each treated species.

[E] = endemic; [*i*] = introduced and acclimatized.

Family NITIDULIDAE Latreille, 1802

Subfamily Cryptarchinae C. G. Thomson, 1859

Genus *Cryptarcha* Shuckard, 1840

1. bifasciata Baudi di Selve, 1870

2. [*incognita* Iablokoff-Khnzorian, 1966]

3. strigata (Fabricius, 1787)

4. undata (Olivier, 1790)

Genus *Glischrochilus* Reitter, 1873

1. grandis (Tournier, 1872)

2. hortensis (Geoffroy, 1785), in Fourcroy, 1785

3. quadriguttatus (Fabricius, 1776)

4. quadrisignatus (Say, 1835) [*i*]

5. quadripunctatus (Linnaeus, 1758)

Genus *Pityophagus* Shuckard, 1840

1. ferrugineus (Linnaeus, 1761)

2. [*laevior* Abeille de Perrin, 1872]

3. quercus Reitter in Putzeys, Reitter, Saulcy & Weise, 1877

Subfamily Nitidulinae Latreille, 1802

Genus *Nitidula* Fabricius, 1775

1. bipunctata (Linnaeus, 1758)

2. carnaria (Schaller, 1783)

3. [*eremita* Audisio, 1990]

ciliata Erichson, 1843

4. flavomaculata (Rossi, 1790

5. [*maculosa* Fairmaire in Fairmaire & Coquerel, 1866]

6. rufipes (Linnaeus, 1767)

Genus *Omosita* Erichson, 1843

1. colon (Linnaeus, 1758)

2. [*depressa* (Linnaeus, 1758)]

3. discoidea (Fabricius, 1775)

Genus *Amphotis* Erichson, 1843

1. marginata (Fabricius, 1781)

2. orientalis Reiche, 1861

Genus *Soronia* Erichson, 1843

1. elongata Cameron, 1903

2. grisea (Linnaeus, 1758)

3. oblonga C. Brisout de Barneville in Grenier, 1863

4. [*punctatissima* (Illiger, 1794)]

Genus *Stelidota* Erichson, 1843

1. geminata (Say, 1825) [*i*]

[Genus *Anister* Grouvelle, 1901]

1. [*raffrayi* Grouvelle, 1901]

[Genus *Ipidia* Erichson, 1843]

1. [*binotata* Reitter, 1875]

2. [*sexguttata* (R. F. Sahlberg, 1834)]

Genus *Cychramus* Kugelann, 1794

1. luteus (Fabricius, 1787)

2. [*variegatus* (Herbst, 1792)]

Genus *Xenostrongylus* Wollaston, 1854

1. levantinus Audisio & Jelínek, 2001 in Audisio, Mariotti, Jelínek & De Biase, 2001 [E]

[Genus *Cyllodes* Erichson, 1843]

1. [*ater* (Herbst, 1792)]

[Genus *Physoronia* Reitter, 1884]

1. [*wajdelota* (Wankowicz, 1869)]

Genus *Pocadius* Erichson, 1843

1. adustus Reitter, 1888

2. ferrugineus (Fabricius, 1775)

Genus *Thalycra* Erichson, 1843

1. fervida (Olivier, 1790)

[Genus *Oxystrongylus* Reitter, 1911]

1. [*sanctissimus* Roubal, 1927]

Subfamily Meligethinae C. G. Thomson, 1859

Genus *Pria* Stephens, 1830

1. angustula Cooper, 1982

zenobia Jelínek, 1997 (**syn. nov.**)

2. dulcamarae (Scopoli, 1763)

3. [*transitoria* Kirejtshuk, 1979]

Genus *Meligethinus* Grouvelle, 1906

1. [*gedrosiacus* Jelínek, 1981]

2. pallidulus (Erichson, 1843) [*i*]

Genus *Meligethes* Stephens, 1830

1. atratus (Olivier, 1790)

2. denticulatus (Heer, 1841)

3. flavimanus Stephens, 1830

Genus *Brassicogethes* Audisio & Cline, 2009

1. aeneus (Fabricius, 1775)

2. anthracinus (C. Brisout de Barneville, 1863)

3. arankae (Audisio & De Biase, 2005), in Audisio, De Biase, Antonini & Mancini, 2005

longulus auct., non (Schilsky, 1894), *partim*

4. armeniacus (Audisio, Jelínek & Stevanović, 1999)

5. bithynicus (Audisio, 1988) [E]

6. coracinus (Sturm, 1845)

7. coracimimus Audisio & Cline, 2011, in Audisio, Cline, Mancini, Trizzino, Avgin & De Biase, 2011

8. cristofaroi (Audisio & De Biase, 2005), in Audisio, De Biase, Antonini, Mancini, Özbek & Gultekin, 2005 [E]

9. [*czwalinai* (Reitter, 1871)]

10. erysimicola (Audisio & De Biase, 2001), in Audisio, De Biase, Antonini, Belfiore & Oliverio, 2001

longulus auct., non (Schilsky, 1894), *partim*
11. gloriae Audisio & Cline, 2011, in Audisio, Cline, Mancini, Trizzino, Avgin & De Biase, 2011 [**E**]
longulus auct., non (Schilsky, 1894), *partim*
12. longulus (Schilsky, 1894)
13. [*lunariae* (Audisio & De Biase) in Audisio, De Biase, Romanelli, Angelici, Ketmaier & De Matthaeis, 1999]*
14. matronalis (Audisio & Spornraft, 1990)
15. prometheus (Jelínek, 1982)
16. reitteri (Schilsky, 1894)
17. [*subaeneus* (Sturm, 1845)]
18. viridescens (Fabricius, 1787)

*This southern Italian and Balkan species (Audisio et al., 1999) could be present in western European Turkey.

Genus *Clypeogethes* Scholz, 1932
1. lepidii (Miller, 1851)
2. mithra (Jelínek, 1978)
3. tener (Reitter, 1873)
4. wittmeri (Jelínek & Audisio, 1977) [**E**]

Genus *Xerogethes* Audisio & Cline, 2009
1. discoideus (Erichson, 1845)
2. kraatzii (Reitter, 1871)
3. osellai (Audisio & Jelínek, 2000), in Audisio, Jelinék, Mariotti & De Biase, 2000 [**E**]
4. rotundicollis (C. Brisout de Barneville, 1863)

Genus *Acanthogethes* Reitter, 1871
1. brevis (Sturm, 1845)
2. reyi (Guillebeau, 1885)
3. solidus (Kugelann, 1794)

Genus *Boragogethes* Audisio & Cline, 2009
1. mandibularis (J. Sahlberg, 1913)
2. punctatissimus (Reitter, 1896)
3. rosenhaueri (Reitter, 1871)
4. symphyti (Heer, 1841)

Genus *Fabogethes* Audisio & Cline, 2009
1. brachialis (Erichson, 1845)
2. diversus (Schilsky, 1893)
3. nigrescens (Stephens, 1830)
4. [*opacus* (Rosenhauer, 1856)]
5. varicollis (Wollaston, 1854)*

*Presence of the rare W Mediterranean *F. varicollis* in northern Turkey (Giresun Province, Bulancak) is based on a problematic record based on a single specimen that may have been mislabeled by the collector (Audisio, 1993a; Audisio et al., 2000).

Genus *Genistogethes* Audisio & Cline, 2009
1. bidentatus (C. Brisout de Barneville, 1863)
2. carinulatus (Förster, 1849)
3. erichsonii (C. Brisout de Barneville, 1863)
4. immundus (Kraatz, 1858)
5. punctatus (C. Brisout de Barneville, 1863)
6. zapparolii (Audisio, 1989)

Genus *Astylogethes* Kirejtshuk, 1992
1. [*corvinus* (Erichson, 1845)]
2. subrugosus (Gyllenhal, 1808)
caudatus (Guillebeau, 1897)
3. substrigosus (Erichson, 1845)
subrugosus auct., non (Gyllenhal, 1808)

Genus *Lamiogethes* Audisio & Cline, 2009
1. aeneoviridinitens (Audisio, 1993)
2. amei (Audisio & Kirejtshuk, 1988)
3. [*atramentarius* (Förster, 1849)]
4. atrovirens (Jelínek, 1982)
5. bidens (C. Brisout de Barneville, 1863)
6. bolognai (Audisio, 1977)
7. brunnicornis (Sturm, 1845)
8. bucciarellii (Audisio, 1976)
9. buyssoni (C. Brisout de Barneville, 1882)
10. dieckmanni (Audisio & Jelínek, 1984)
11. difficilis (Heer, 1841)
12. haemorrhoidalis (Förster, 1849)
13. jelineki (Audisio, 1976)
14. [*kaszabi* (Audisio, 1979)]
15. kirejtshuki (Audisio, 1979)
16. kunzei (Erichson, 1845)
17. [*leati* (Easton, 1956)]
18. medvedevi (Kirejtshuk, 1978)
19. morosus (Erichson, 1845)
20. [*ochropus* (Sturm, 1845)]
21. pedicularius (Gyllenhal, 1808)
viduatus (Heer, 1841)
22. persicus (Faldermann, 1837)
pedicularius auct., non (Gyllenhal, 1808)
23. [*serripes* (Gyllenhal, 1827)]
24. sulcatus (C. Brisout de Barneville, 1863)

Genus *Stachygethes* Audisio & Cline, 2009
1. assimilis (Sturm, 1845)
2. khnzoriani (Kirejtshuk, 1979)
3. nanus (Erichson, 1845)
4. ruficornis (Marsham, 1802)
5. saxatilis (Audisio, 1988) [**E**]
6. [*syriacus* (C. Brisout de Barneville, 1872)]
7. turcicus (Jelínek, 1982) [**E**]
8. variolosus (Easton, 1964)
9. villosus (C. Brisout de Barneville, 1863)
10. zarudnyi (Kirejtshuk, 1984)

Genus *Thymogethes* Audisio & Cline, 2009
1. acicularis (C. Brisout de Barneville, 1863)
2. egenus (Erichson, 1845)
3. funereus (Jelínek, 1967)
4. gagathinus (Erichson, 1845)
5. lugubris (Sturm, 1845)
6. submetallicus (Sainte-Claire Deville, 1908)

Genus *Sagittogethes* Audisio & Cline, 2009

1. ater (C. Brisout de Barneville, 1863)*

2. biondii (Audisio, 1988) [**E**]

3. devillei (Grouvelle, 1912)

4. distinctus (Sturm, 1845)

5. hladili (Jelínek, 1982)

6. hoffmanni (Reitter, 1871)

7. holzschuhi (Jelínek & Spornraft, 1979) [**E**]

8. incanus (Sturm, 1845)

9. interjectus (Jelínek & Spornraft, 1979) [**E**]

10. jordanis (Jelínek & Spornraft, 1979)

11. maurus (Sturm, 1845)

12. [*minutus* (C. Brisout de Barneville, 1863)]

13. [*ovatus* (Sturm, 1845)]

14. [*perceptus* (Jelínek & Spornraft, 1979)]

15. tauricus (Jelínek & Spornraft, 1979)

16. umbrosus (Sturm, 1845)

17. vomer (Kirejtshuk, 1978)

*The attribution of Anatolian populations of *Sagittogethes ater* (associated as larvae with *Salvia* spp., Lamiaceae) to the true *S. ater* (known with certainty from SE France, NE Italy, and SE Europe including Greece, and strictly associated as larvae with *Salvia officinalis* L.) is thus far uncertain pending comparative molecular data on European and Anatolian groups of populations.

Genus *Afrogethes* Audisio & Cline, 2009

1. buduensis (Ganglbauer, 1899)

2. [*klapperichi* (Easton, 1957)]

3. pectinatus (Schilsky, 1894)

4. planiusculus (Heer, 1841)

5. [*schilskyi* (Reitter, 1896)]

6. tristis (Sturm, 1845)

7. [*yemenensis* (Easton, 1954)]

Subfamily Epuraeinae Kirejtshuk, 1986

Genus *Epuraea* Erichson, 1843

1. aestiva (Linnaeus, 1758)

2. angustula Sturm, 1844

3. [*argus* Reitter, 1894]

4. biguttata (Thunberg, 1784)

5. [*binotata* Reitter, 1873]

6. boreella (Zetterstedt, 1828)

7. [*carpathica* (Reitter, 1878)]

8. [*distincta* (Grimmer, 1841)]

9. [*fageticola* Audisio, 1991]

10. fuscicollis (Stephens, 1835)

11. [*georgica* Reitter, 1877]

12. [*guttata* (Olivier, 1811)]

13. [*laeviuscula* (Gyllenhal, 1827)]

14. [*limbata* (Fabricius, 1787)]

15. [*longiclavis* Sjöberg, 1939]

16. longula Erichson, 1845

17. marseuli Reitter, 1873

18. melina Erichson, 1843

19. muehli Reitter, 1908b

20. neglecta (Heer, 1841)

21. [*oblonga* (Herbst, 1793)]

22. pallescens (Stephens, 1835)

23. [*placida* Mäklin in Mannerheim, 1853]

24. pygmaea (Gyllenhal, 1808)

25. [*rufomarginata* (Stephens, 1830)]

26. [*sengleti* Audisio, 1991]

27. [*silacea* (Herbst, 1784)]

28. [*silesiaca* Reitter, 1873]

29. subparallela Grouvelle, 1896 [**E**]

30. sutcuimamun Avgin, Audisio & Lasoń, 2012, in Avgin, Magri, Antonini, Mancini, Jansson, Lasoń, Cline & Audisio, 2012 [**E**]

latipes auct., non Grouvelle, 1896, *partim*

31. terminalis (Mannerheim, 1843)

32. thoracica Tournier, 1872

33. unicolor (Olivier, 1790)

34. [*variegata* (Herbst, 1793)]

Genus *Haptoncus* Murray, 1864

1. luteolus (Erichson, 1843) [***i***]

2. ocularis (Fairmaire, 1849) [***i***]

Genus *Micruria* Reitter, 1875

1. melanocephala (Marsham, 1802)

Subfamily Carpophilinae Erichson, 1842

Genus *Carpophilus* Stephens, 1830

1. *bifenestratus* Murray, 1864 [***i***]

tersus Wollaston, 1865

2. *bipustulatus* Heer, 1841

3. *dimidiatus* (Fabricius, 1792) [***i***]

4. *fumatus* Boheman, 1851 [***i***]

5. *hemipterus* (Linnaeus, 1758) [***i***]

6. [*jelineki* Audisio & Kirejtshuk, 1989] [***i***]

7. *marginellus* Motschulsky, 1858 [***i***]

8. *mutilatus* Erichson, 1843 [***i***]

9. *nepos* Murray, 1864 [***i***]

freemani Dobson, 1956: 41

10. *obsoletus* Erichson, 1843 [***i***]

11. *quadrisignatus* Erichson, 1843 [***i***]

12. *sexpustulatus* (Fabricius, 1792)

13. *truncatus* Murray, 1864 [***i***]

pilosellus auct. (non Motschulsky, 1858)

14. *zeaphilus* Dobson, 1969 [***i***]

Genus *Urophorus* Murray, 1864

1. [*aria* Audisio, Kirejtshuk & Jelínek, 1990]

2. colonnellii Audisio et Kirejtshuk, 1989 [**E**]

3. humeralis (Fabricius, 1798) [***i***]

4. [*rubripennis* (Heer, 1841)]

5. yakushenkoi Audisio et Kirejtshuk, 1989

Acknowledgments
Sincere thanks are due to the several friends and colleagues who collected with us and provided several interesting species in Turkey during common or independent fieldtrips: I & P Rapuzzi (Ronchi di Cialla, Udine, Italy), MA Bologna (Rome), E Colonnelli (Rome), M Biondi (L'Aquila, Italy), and E Yıldırım, H Özbek, and L Gültekin (Erzurum).

References

Audisio P (1993a). Nuovi dati faunistici e bionomici sui *Meligethes* di Turchia orientale, con descrizione di una nuova specie del gruppo di *M. difficilis* (Coleoptera, Nitidulidae, Meligethinae). Fragm Entomol 24: 181–193 (in Italian).

Audisio, P (1993b). Coleoptera Nitidulidae-Kateretidae. Fauna d'Italia, Vol. 32. Bologna, Italy: Calderini.

Audisio P, Belfiore C, De Biase A, Antonini G (2001a). Identification of *Meligethes matronalis* Audisio and Spornraft, 1990 and *M. subaeneus* Sturm, 1845, based on morphometric and bionomic characters (Coleoptera: Nitidulidae). Europ J Entomol 98: 87–97.

Audisio P, Chiari S, Zauli A, Jansson N, Carpaneto GM (2011). *Pityophagus quercus* Reitter, 1877, a new saproxylic sap beetle of the Italian fauna (Coleoptera, Nitidulidae). Fragm Entomol 43: 147–152.

Audisio P, Cline AR, De Biase A, Antonini G, Mancini E, Trizzino M, Costantini L, Strika S, Lamanna F, Cerretti P (2009). Preliminary re-examination of genus-level taxonomy of the Pollen Beetle subfamily Meligethinae (Coleoptera: Nitidulidae). Acta Entomol Mus Nat Pragae 49: 341–504.

Audisio P, Cline AR, Mancini E, Trizzino M, Avgin SS, De Biase A (2011). Four new Palaearctic *Brassicogethes* (Coleoptera, Nitidulidae, Meligethinae), and phylogenetic inference on the *B. coracinus* group. Rendic Lincei 22: 235–268.

Audisio P, Cline AR, Solano E, Mancini E, Lamanna F, Antonini G, Trizzino M (2014). A peculiar new genus and species of pollen-beetle (Coleoptera, Nitidulidae) from eastern Africa, with a molecular phylogeny of related Meligethinae. Syst Biodiv 12: 77–91.

Audisio P, De Biase A, Antonini G, Mancini E (2005a). Two new *Meligethes* of the *M. coracinus* complex from southern Europe (Coleoptera, Nitidulidae, Meligethinae). Fragm Entomol 37: 65–89.

Audisio P, De Biase A, Antonini G, Belfiore C, Oliverio M (2001a). Morphological, molecular, and ecological evidence of a new Euro-Anatolian species of the *Meligethes coracinus* complex (Coleoptera: Nitidulidae). Ins Syst Evol 31: 361–385.

Audisio P, De Biase A, Antonini G, Mancini E, Özbek H, Gultekin L (2005b). Redescription and natural history of *Meligethes longulus* Schilsky, 1894, and provisional revision of the *M. coracinus* species-complex (Coleoptera, Nitidulidae, Meligethinae). It J Zool 72: 73–85.

Audisio P, De Biase A, Romanelli P, Angelici MC, Ketmaier V, De Matthaeis E (1999). Molecular re-examination of the taxonomy of the *Meligethes viridescens* species complex (Coleoptera: Nitidulidae). Biochem Syst Ecol 28: 1–13.

Audisio P, De Biase A, Trizzino M, Kirk-Spriggs AH, Cline AR, Antonini G, Mancini E (2008). Molecular biogeography of Mediterranean and southern African disjunctions as exemplified by pollen beetles of the *Meligethes planiusculus* species-complex (Coleoptera: Nitidulidae; Meligethinae). Biogeographia 29: 45–65.

Audisio P, Jelínek J (2005–2013). Coleoptera: Nitidulidae. Fauna Europaea Version 2.4. Available at http://www.faunaeur.org.

Audisio P, Jelínek J, Cline AR, Mancini E, Trizzino M, Cerretti P, Antonini G (2011). Description and taxonomic position of a new genus and species of southern African pollen beetle (Coleoptera: Nitidulidae: Meligethinae). Zootaxa 2927: 49–56.

Audisio P, Jelínek J, Mariotti A, De Biase A (2000). The Coleoptera Nitidulidae and Kateretidae from Anatolian, Caucasian and Middle East regions. Biogeographia 21: 241–354.

Audisio P, Mancini E, De Biase A (2006). A new species of the pollen-beetle genus *Meligethes* (Coleoptera: Nitidulidae) of the *M. aeneus* group from Greece, with review of the *M. subaeneus* complex. Zootaxa 1275: 43–60.

Audisio P, Mariotti A, Jelinek J, De Biase A (2001b). *Xenostrongylus levantinus* sp. n. from Eastern Mediterranean, with notes on the generic classification of *Xenostrongylus* Wollaston, 1854 and *Strongyllodes* Kirejtshuk, 1992 (Coleoptera: Nitidulidae). Ann Soc Ent Fr 37: 491–499.

Audisio P, Özbek H, Antonini G, Aslan I (2003). New data on distribution and ecology of some Turkish Nitidulidae and Kateretidae (Coleoptera). Türk Entomol Derg 26: 243–250.

Avgin SS, Magri D, Antonini G, Mancini E, Jansson N, Lasoń A, Cline AR, Audisio P (2012). Review of the cedar and oak forest-associated *Epuraea latipes* species group (Coleoptera: Nitidulidae, Epuraeinae), with description of a new species from southern Turkey. Ent Fennica 23: 49–62.

Barnouin T, Audisio P, Soldati F, Noblecourt T (2011). *Pityophagus quercus* Reitter, 1877, espèce nouvelle pour la faune de France (Coleoptera, Nitidulidae). RARE, Rev Ass Roussill Ent 20: 116–120 (in French).

Bologna M, Audisio P, Biondi M, Casale A (2008). The biogeographical patterns of disjunct distribution with special emphasis on the Mediterranean and southern African model. Biogeographia 29: 7–17.

Cecchi L (2011). A reappraisal of *Phyllolepidum* (Brassicaceae), a neglected genus of the European flora, and its relationships in tribe Alysseae. Plant Biosyst 145: 818–831.

Cooper MC (1982). The species of the genus *Pria* Stephens (Coleoptera: Nitidulidae). Zool J Linn Soc 75: 327–390.

De Biase A, Antonini G, Mancini E, Trizzino M, Cline AR, Audisio P (2012). Discordant patterns in the genetic, ecological, and morphological diversification of a recently radiated phytophagous beetle clade (Coleoptera: Nitidulidae: Meligethinae). Rend Lincei 23: 207–215.

Ganglbauer L (1899). Die Käfer von Mitterleuropa, Vol. III. Vienna: Gerolds Sohn Verlag (in German).

Horion A (1960). Faunistik der Mitteleuropäischen Käfer. Band III: Clavicornia, 1. (Sphaeritidae bis Phalacridae). Überlingen am Bodensee, Germany: A. Feyel Verlag (in German).

Jelínek J (1979) Revision of the genus *Epuraea* Er. from Africa with remarks to related genera (Col., Nitidulidae). Acta Entomol Mus Nat Pragae 39: 345–397.

Jelínek J (1982). New and little known species of the genus *Meligethes* from Turkey and neighbouring countries (Coleoptera, Nitidulidae). Türk Bit Kor Derg 5: 201–214.

Jelínek J (1992). Nitidulidae (Coleoptera) associated with flowers of oil palm, *Elaeis guineensis* (Arecales, Arecaceae), in Rwanda. Acta Entomol Bohemoslov 89: 409–427.

Jelínek J, Audisio P (1977). Tassonomia e distribuzione geografica di *Meligethes coerulescens* Kraatz e specie correlate (Coleoptera, Nitidulidae). Boll Mus Zool Univ Torino 1977: 1–14 (in Italian).

Jelínek J, Audisio P (2007). Family Nitidulidae. In: Löbl I, Smetana A, editors. Catalogue of Palaearctic Coleoptera. Vol. 4: Elateroidea - Derodontoidea - Bostrichoidea - Lymexyloidea - Cleroidea - Cucujoidea. Stenstrup, Denmark: Apollo Books, pp. 459–491.

Jelínek J, Audisio P (2009). The Kateretidae, Nitidulidae and Monotomidae (Coleoptera: Cucujoidea) described by Gistel (1856, 1857): new synonymies and type designations. Acta Entomol Mus Nat Pragae 49: 225–238.

Kirejtshuk AG (1978). New species of the genus *Meligethes* Stephens (Coleoptera, Nitidulidae) from the USSR and review of the group of species related to *Meligethes umbrosus* Sturm. Ent Obozr 57: 578–595 (in Russian).

Kirejtshuk AG (1996). Some results of study on the Nitidulidae from Namibia and adjacent territories. Part 1 (Coleoptera, Cucujoidea, Nitidulidae). Mitt Zool Mus Berlin 72: 21–52.

Kirejtshuk AG (1997). New Palaearctic nitidulid beetles, with notes on synonymy and systematic position of some species (Coleoptera: Nitidulidae). Zoosyst Ross 6: 255–268.

Lasoń A (2007). A contribution to the knowledge of the sap beetles of Turkey (Coleoptera: Nitidulidae and Kateretidae). Ann Upper Siles Mus Ent 14–15: 195–221.

Lasoń A, Ghahari H (2013). A checklist of the Kateretidae and Nitidulidae of Iran (Coleoptera: Cucujoidea). Zootaxa 3746: 101–122.

Rutanen I, Wanntorp HK, Fägerström C (2010). Two pollen beetles, *Meligethes subrugosus* (Gyllenhal, 1808) and *Meligethes substrigosus* Erichson, 1845 in northern Europe. Ent Tidskr 131: 177–184.

Yıldırım E, Aslan İ, Özbek H (1996). Ülkemiz için yeni bir korunga (*Onobrychis sativa* Lam.) zararlisi, *Meligethes acicularis* Briston (Coleoptera, Nitidulidae). In: Turkiye 3. Çayir-Mer'a ve Yembitkileri Kongresi, 17–19 June 1996, Erzurum, Turkey, pp. 810–815.