

## New data on the distribution and host plants of subfamily Agrilinae in Bulgaria

(Coleoptera, Buprestidae)

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New data about the distribution of 31 species and subspecies and host plants of 8 taxa belonging to subfamily Agrilinae are presented. In addition, some morphological characters, which allow better identification of *Agrilus angustulus angustulus*, *A. buresi*, *A. laticornis* and *A. obscuricollis* are illustrated.

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### Introduction

The biggest subfamily in Buprestidae, Agrilinae, includes around 1090 species and subspecies in the Palaearctic region (Jendek 2016a, Kalashian & Kubáň 2016, Kubáň 2016) and 63 in Bulgaria (Sakalian 2003).

The aim of this work is presentation of new data about the distribution of 31 species and subspecies and host plants of 8 taxa from subfamily Agrilinae in Bulgaria.

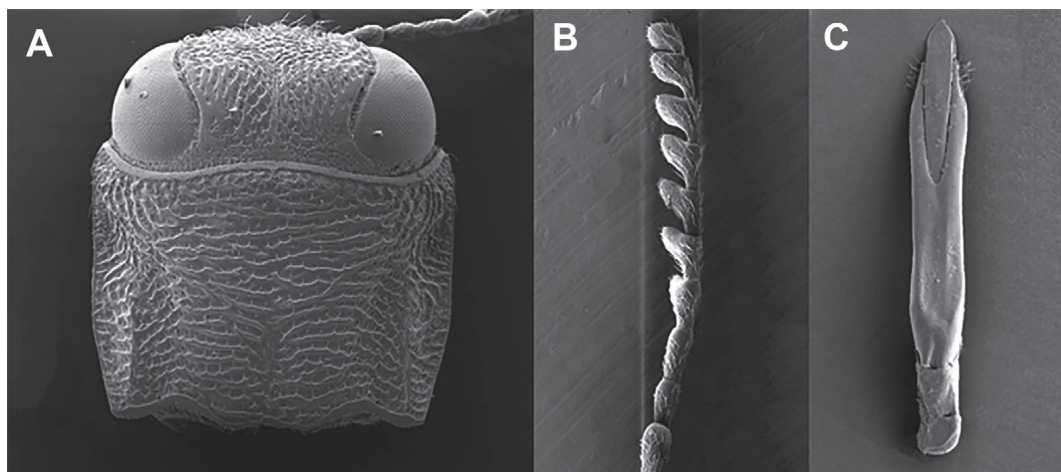
### Material and methods

Specimens were collected by traditional entomological methods: collecting on flowers and bushes by

entomological net; shaking of tree branches and crowns; collecting by soil traps, yellow tree traps, Malaise and pheromone traps; rearing of adults in laboratory conditions from infested parts of host plants.

Additional data for some species and subspecies recorded in Bulgaria, received from Manfred Niehuis, are also included. Latter information does not contain data about the number of specimens found for each species or subspecies, that is why these taxa are listed below without specifying the number.

The SEM photomicrographs were obtained using a JEOL GSM-5510, operating at 10 kV, the images were produced with a secondary electron detector at high vacuum. The magnification used to take each photomicrograph is shown in the corresponding photo.



**Fig. 1.** *Agrilus angustulus angustulus*. **A.** Vertex and pronotum ( $\times 147$ ). **B.** Antenna ( $\times 257$ ). **C.** Aedeagus ( $\times 148$ ).

The names of tribes and species and subspecies are listed in alphabetical order. Bulgarian geographical regions are presented according to Guéorguiev et al. (1997).

The collections where the studied specimens are kept are listed in the text below. In this work, the following abbreviations are used: DD, collection Danail Doychev; EM, collection Enrico Migliaccio; p.c., personal communication; VG, collection Victor Gashtarov; VS, collection Vladimir Sakalian.

## Results and discussion

### Subfamily Agrilinae Laporte, 1835

#### Tribe Agrilini Laporte, 1835

#### *Agrilus albogularis albogularis* Gory, 1841

**Material.** Boboshevo-Simitli Valley: 7 km from Simitli, 25.06.2002, 1 ex., leg. E. Migliaccio (EM).

#### *Agrilus angustulus angustulus* (Illiger, 1803)

**Material.** Sofia Plain: W Bezden, 42°52'53" N, 23°05'55" E, 561 m, 20.04.2016, 1 ex., leg. T. Ljubomirov (VS); Sandanski-Petrich Valley: Marikostenska Tumba near Novo Konomladi, reared from branches of *Quercus pubescens*, sample collection – 14.04.2003, adult emergence – 17.05.2003, 1 ex., leg. V. Gashtarov (VG); West Rhodope Mts: Velingrad, 28.06.2002, 1 ex., leg. E. Migliaccio (EM); W Lyaskovo, 41°44'04" N, 24°27'55" E, 1038 m, 05.08.2018, 1 ex.; East Rhodope Mts: NE Varli Dol, 41°21'29" N, 25°19'33" E, 320 m a.s.l., 09.06.2016, 3 ex., leg. T. Ljubomirov (VS); South Black Sea Coast: Krush-evets, 17.05.2002, leg. Schmitt; Ahtopol, 02.07.2004, leg. W. Ziegler (Niehuis, p.c.).

**Remarks.** The following three species, *Agrilus angustulus angustulus*, *Agrilus laticornis* and *Agrilus obscuricollis* are trophically connected with the Fagaceae family, especially *Quercus* spp. They are small and similar and quite difficult to separate. That is why in the text below, we illustrate some of their main morphological characters, which allow a better identification.

#### *Agrilus biguttatus* (Fabricius, 1777)

**Material.** Strandzha Mt.: Marina Reka protected area, 5 km NE Bulgari, 160 m a.s.l., 25.–28.06.2003, 32 ex., leg. E. Migliaccio (EM). Maleshevska Planina Mt.: S from Krupnik, 1200–1300 m a.s.l., beech forest, 05.07.2003, 2 ex., leg. T. Ljubomirov (VS).

#### *Agrilus buresi* Obenberger, 1935

**Material.** North Black Sea Coast: Albena, 150 m a.s.l., 21.05.2001, leg. A. Steidel (Niehuis, p.c.).

**Remarks.** According to Jendek (2016b) “*Agrilus buresi* can be reliably distinguished from *A. sulcicollis* Lacordaire, 1835 only by the shape of the aedeagus. The aedeagus of *A. buresi* is roughly symmetric unlike the obviously asymmetric aedeagus of *A. sulcicollis*”. In Bulgaria, only *A. buresi* occurs (Jendek 2016a). “Faunal records suggest that *A. buresi* is the southeastern vicariant of *A. sulcicollis*” (Jendek 2016b). We have newer collected *A. sulcicollis* in Bulgaria. The aedeagus of *A. buresi* is illustrated (Fig. 2).

#### *Agrilus convexicollis* Redtenbacher, 1847

**Material.** Central Stara planina Mts: Enina, 600 m a.s.l., 01.–18.06.2000, 1 ex., leg. M. Langourov (VS); West

Rhodope Mts: between Asenovgrad and Bachkovo, reared from branch of *Fraxinus ornus*, sample collection – 24.04.2005; adult emergence – 25.05.2005, 1 ex., leg. D. Doychev (DD).

#### *Agrilus cuprescens cuprescens* Ménériés, 1832

**Material.** West Stara Planina Mts: Bezden, 42°52'54" N, 23°05'55" E, 561 m a. s. l., 02–17.07.2016, Malaise trap, 2 ex., leg. N. Karaivanov (VS); Sandanski-Petrich Valley: 2 km W Kresna, 600 m, 27.05.2003, leg. Buchbach & Steidel; North Black Sea Coast: NE Krivini, 42°57'24" N, 27°40'48" E, 70 m a. s. l., 15.05.2012, 1 ex., leg. T. Ljubomirov (VS); South Black Sea Coast: Djuni south from Burgas, 27.06.2004; Sozopol, 01.–08.07.2004, leg. W. Ziegler (Niehuis, p.c.).

#### *Agrilus graminis* Kiesenwetter, 1857

**Material.** Lozenska Planina Mt.: N Pasarel, 42°34'18" N, 23°29'40" E, 933 m, 04.07.2013, 1 ex.; Thracian Plane: Haskovski mineralni bani, 15.06.1962, 1 ex., leg. M. Josifov; Maleshevska Planina Mt.: S from Krupnik, 1200–1300 m a. s. l., beech forest, 05.07.2003, 1 ex., leg. T. Ljubomirov (VS); Belasitsa Mt.: Belasitsa hut, reared from *Castanea sativa*, sample collection – 21–22.04.2010, adult emergence – 17.06.2010, 3 ex., leg. D. Doychev (DD).

#### *Agrilus hastulifer* (Ratzeburg, 1837)

**Material.** Strandzha Mt.: Marina Reka protected area, 5 km NE Bulgari, 160 m a. s. l., 25.–28.06.2003, 43 ex.; Maleshevska Planina Mt.: Manastir Gorna Breznitsa, 550 m a. s. l., 30–31.07.2002, yellow traps, 1 ex.; 01.08.2002, 6 ex., leg. E. Migliaccio (EM); East Rhodope Mts: Gnezdare, 41°23'08" N, 25°55'19" E, 377 m a. s. l., 05.08.2012, 11 ex., leg. T. Ljubomirov (VS).

#### *Agrilus hyperici* (Creutzer, 1799)

**Material.** Rila Mts: Road Borovets-Radouil, 1200 m a. s. l., 26.07.2001, 1 ex.; Boboshevo-Simitli Valley: 7 km from Simitli, 18.07.2001, 1 ex., leg. E. Migliaccio (EM); Maleshevska planina Mt.: Gorna Breznitsa, 630 m a. s. l., 14.06.2002, 1 ex., leg. T. Ljubomirov (VS); Pirin Mts: Road Bunderitsa–Vihren, 1700 m a. s. l., 19.07.2001, 1 ex., leg. E. Migliaccio (EM); North Black Sea Coast: Albena, 28.06.2004; South Black Sea Coast: Primorsko, 27.06.–01.07.2004; Sozopol, 01.–08.07.2004, leg. W. Ziegler (Niehuis, p.c.).

#### *Agrilus laticornis* (Illiger, 1803)

**Material.** East Danubian Plain: Dryanovets, 42°40'42" N, 27°21'55" E, 295 m a. s. l., 21.05.2012, 1 ex., leg. T. Ljubomirov (VS); West Stra Planina Mts: Berkovitsa, reared from branches of *Castanea sativa*, sample collection – 11.10.2002, adult emergence – 2003, 1 ex., leg. D. Doychev (DD); Kraishte Region: Zemen Gorge, S Polska Skakavitsa, 730 m a. s. l., 19.05.2002, 1 ex.; Bakazhishko-Burgas Region: Sadiovo, 42°40'31" N, 27°20'20" E, 184 m a. s. l., 21.05.2012, 1 ex., leg. T. Ljubomirov (VS).



Fig. 2. Aedeagus of *Agrilus buresi* (×141).

**Remarks.** Some of the main morphological characters which distinguish this species are illustrated below (Fig. 3).

#### *Agrilus lineola lineola* Kiesenwetter, 1857

**Material.** South Black Sea Coast: Ropotamo protected area near Sozopol, 26.06.2003, 2 ex., leg. E. Migliaccio (EM).

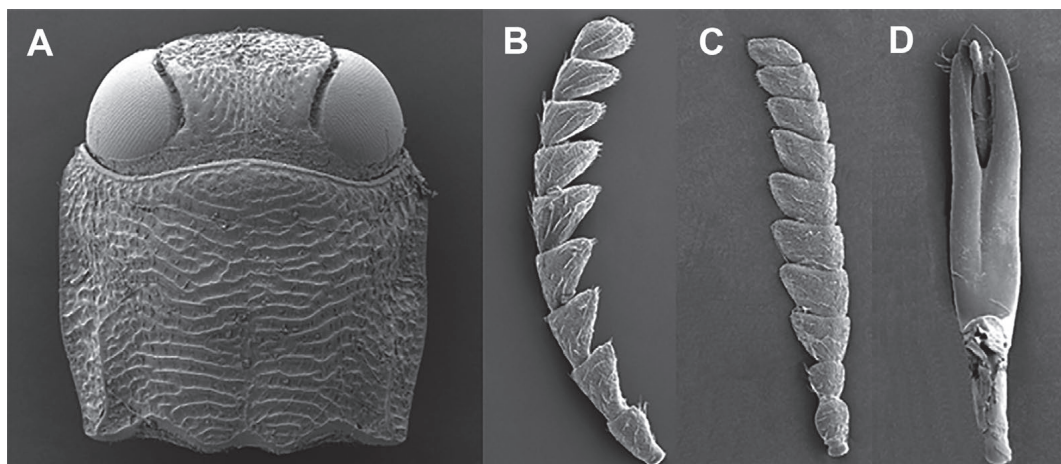
#### *Agrilus macroderus* Abeille de Perrin, 1897

**Material.** South Black Sea Coast: Primorsko, 01.07.2004; Sozopol, 01.–08.07.2004, leg. W. Ziegler (Niehuis, p.c.).

#### *Agrilus obscuricollis* Kiesenwetter, 1857

**Material.** Central Stara Planina Mts: Enina, 600 m a. s. l., 01–18.06.2000, tree traps, 2 ex., leg. M. Langourov (VS); Strandzha Mt.: Marina Reka protected area, 5 km NE Bulgari, 160 m a. s. l., 25.–28.06.2003, 2 ex.; West Rhodope Mts: Road Iakorouda-Velingrad, 850 m a. s. l., 20.07.2001, 1 ex., leg. E. Migliaccio (EM); South Black Sea Coast: Achtopol, 02.07.2004; Ravadinovo, 03.07.2004, leg. W. Ziegler (Niehuis, p.c.).

**Remarks.** Illustrations of some main morphological characters of the species are presented below (Fig. 4).



**Fig. 3.** *Agrilus laticornis*. **A.** Vertex and pronotum ( $\times 142$ ). **B.** Antenna female ( $\times 304$ ). **C.** Antenna male ( $\times 210$ ). **D.** Aedeagus ( $\times 167$ ).

#### *Agrilus olivicolor* Kiesenwetter, 1857

**Material.** Middle Danubian Plane: W Lozitsa, 43°35'55" N, 24°58'27" E, 237 m, pheromone traps, 16.–23.08.2015, 1 ex.; 23.06.–01.08.2017, 1 ex., leg. T. Toshova (VS); West Stara Planina Mts: Petrohan, 4 km S Barziya, 43°09'19" N, 23°08'50" E, 750 m a.s.l., reared from branches of *Fagus sylvatica*, sample collection – 03.04.2016, adult emergence – 24.11.1016, 3 ex.; Kraishite Region: Golo Burdo Mt.: Ostritsa protected area, 900 m a.s.l., reared from trunk of *Carpinus betulus*, sample collection – 26.04.2003, adult emergence – 18.05.2003, 1 ex., leg. D. Doychev (DD).

#### *Agrilus roscidus* Kiesenwetter, 1857

**Material.** Kraishite Region: Golo Burdo Mt.: Ostritsa protected area, reared from branches of *Sorbus aria*, sample collection – 14.04.2002, adult emergence – exact date in 2002 unknown, 4 ex., leg. D. Doychev (DD); Pirin Mts: Bansko, 1200 m a.s.l., 26.07.2001, 1 ex., leg. E. Migliaccio; Sandanski-Petrich Valley: 2 km S from Kamenitsa, 170–240 m a.s.l., 31.05.–23.06.2002, tree traps, 1 ex., leg. M. Langourov; 23.06.–08.08.2002, tree traps, 4 ex., leg. D. Chobanov; Kresna Gorge: Peyo Yavorov, 19.07.–09.08.2002, tree traps, leg. E. Migliaccio (EM); East Rhodope Mts: Ivaylovgrad, reared from branches of *Amygdalus communis*, sample collection – 05.05.2003, adult emergence – 05.2003, 1 ex. leg. V. Gashtarov (VG); South Black Sea Coast: Primorsko, 27.06.2004; Djuni south from Burgas, 27.06.2004; Sozopol, 01.–08.07.2004, leg. W. Ziegler (Niehuis, p.c.).

#### *Agrilus sinuatus sinuatus* (Olivier, 1790)

**Material.** Kraishite Region: Golo Burdo Mt.: Ostritsa protected area, on *Sorbus aria*, 07.07.2002, 3 ex., leg. D. Doychev (DD); South Black Sea Coast: Sozopol, 01.–08.07.2004, leg. W. Ziegler (Niehuis, p.c.).

#### *Agrilus viridicaerulans rubi* Schaefer, 1937

**Material.** East Danubian Plane: Banitsa, 43°26'20" N, 23°41'07" E, 275 m a.s.l., Malaise trap, 16.–30.06.2013, 1 ex., leg. T. Ljubomirov; Middle Danubian Plane: W Lozitsa, 43°35'55" N, 24°58'27" E, 237 m a.s.l., 22.08.–06.09.2017, pheromone traps, 1 ex., leg. T. Toshova; Sofia Plaine: Bezden, 42°52'54" N, 23°05'55" E, 561 m a.s.l., Malaise trap, 17.07.–21.08.2016, 1 ex.; 09.10.–07.11.2016, 2 ex., leg. N. Karaivanov; Maleshevska Planina Mt.: N Gorna Breznitsa: Momina skala place, 550 m a.s.l., 15.08.–02.10.2003, tree traps, 1 ex., leg. T. Ljubomirov (VS); Sandanski-Petrich Valley: Ilendentsi, 450 m a.s.l., 31.05.2003, leg. Buchbach & Steidel (Niehuis, p.c.); South Black Sea Coast: Ropotamo protected area near Sozopol, 26.06.2003, 1 ex., leg. E. Migliaccio (EM).

#### *Agrilus viridis* (Linnaeus, 1758)

**Material.** Rila Mts: N Parangalitsa protected area, 42°02'31" N, 23°23'18" E, 1671 m a.s.l., 15.09.2013, 1 ex., leg. T. Ljubomirov (VS); East Rhodope Mts: Bryagovets, reared from *Alnus glutinosa*, sample collection – 03.05.2003, adult emergence – 06.2003, leg. V. Gashtarov (VG).

#### Tribe Aphanisticini Jacquelin du Val, 1859

##### *Aphanisticus pygmaeus* Lucas, 1846

**Material.** Sandanski-Petrich Valley: SE Ribnik, 41°28'58" N, 23°16'14" E, 92 m a.s.l., 20.06.2015, 1 ex., leg. E. Chehlarov (VS).

##### *Cylindromorphus filum* (Gyllenhal, 1817)

**Material.** Central Stra Planina Mts: Stanchov Han, 42°48'32" N, 25°33'59" E, 580 m a.s.l., 24.05.2012, 14 ex.,

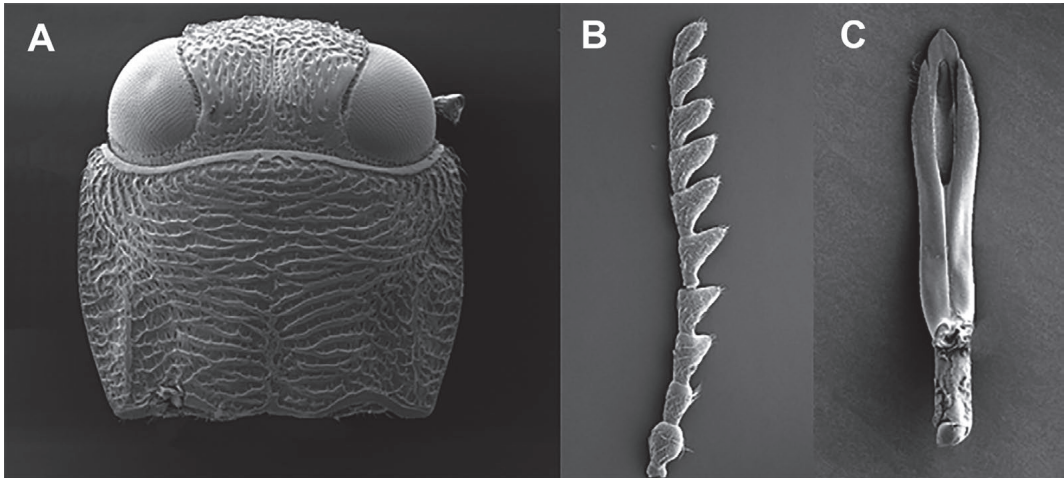


Fig. 4. *Agrilus obscuricollis*. A. Vertex and pronotum ( $\times 151$ ). B. Antenna ( $\times 251$ ). C. Aedeagus ( $\times 137$ ).

leg. O. Todorov (VS); North Black Sea Coast: Albena, 28.06.2004, leg. W. Ziegler (Niehuis, p.c.).

***Paracylindromorphus subuliformis subuliformis* (Mannerheim, 1837)**

**Material.** North Black Sea Coast: Albena, 28.06.2004, leg. W. Ziegler (Niehuis, p.c.).

**Tribe Coraebini Bedel, 1921**

***Coraebus elatus* (Fabricius, 1787)**

**Material.** Central Stara Planina Mts: Velchevtsi, 42°47'52" N, 25°34'08" E, 655 m a.s.l., 22.06.2012, 1 ex., Muhtsenitsa Peak, 42°47'55" N, 22°25'40" E, 945 m a.s.l., 08.07.2012, 1 ex.; Sokolski Manastir, 42°46'38" N, 25°19'37" E, 907 m a.s.l., 10.07.2012, 2 ex., leg. O. Todorov; Thracian Plain: S Zelenikovo, 42°22'50" N, 25°04'43" E, 290 m a.s.l., 28.05.2018, 1 ex.; S Sinitovo 42°07'38" N, 24°22'29" E, 274 m a.s.l., 30.04.2020, 3 ex.; Sakar-Tundzha Region: W Izvorovo, 41°57'05" N, 26°05'53" E, 212 m a.s.l., 21.06.2012, 1 ex., leg. T. Ljubomirov (VS); Boboshevo-Simitli Valley: 10 km S Blagoevgrad, 13.06.1965, 1 ex., leg. M. Josifov; 7 km from Simitli, 18.07.2001, 1 ex.; Malashevska Planina Mt.: Manastir Gorna Breznitsa, 550 m a.s.l., 30.-31.07.2002, yellow traps, 6 ex., leg. E. Migliaccio (EM); SW Gorna Breznitsa, 540 m a.s.l., 02.-04.07.2003, Malaise trap, 2 ex., T. Ljubomirov; Sandanski-Petrich Valley: Sandanski, 01.06.1984, 1 ex., leg. M. Josifov (VS); Rupite, 27.04.2002, 2 ex.; SE slope of Sveti Iliya Hill near Kalimantsi, 450-510 m a.s.l., 10.-11.05.2002, 26 ex.; Chuyepetel North from Katountsi, 350 m a.s.l., 12.05.2002, 6 ex.; West Rhodope Mts: Road Iakorouda-Velingrad, 850 m a.s.l., 20.07.2001, 1 ex., leg. E. Migliaccio (EM); Gyovren, 41°40'06" N, 24°23'37" E, 1510 m a.s.l.,

17.08.2013, 2 ex., leg. O. Todorov; Chervenata Stena protected area, 41°54'15" N, 24°52'44" E, 1310 m a.s.l., 26.06.2014, 5 ex., leg. T. Ljubomirov; East Rhodope Mts: Gorno Pole, 41°39' N, 25°51' E, 442 m a.s.l., 03.06.2012, 1 ex., leg. O. Todorov (VS); North Black Sea Coast: Albena, 28.06.2004, leg. W. Ziegler; South Black Sea Coast: Lozenets, 13.05.2002; Veselie, 16.05.2002, leg. Schmitt; Djuni south from Burgas, 27.06.2004, leg. W. Ziegler (Niehuis, p.c.); W Shirokovo, 19.05.2016, 3 ex., leg. T. Ljubomirov (VS).

***Coraebus rubi* (Linnaeus, 1767)**

**Material.** East Danubian Plain: E Vetren, 44°07'23" N, 27°03'32" E, 27 m a.s.l., 25.07.2012, 1 ex., leg. T. Ljubomirov; Granichar, 43°43'24" N, 28°30'14" E, 43 m a.s.l., 23.07.2017, 1 ex., leg. N. Karaivanov (VS); Strandzha Mt.: Marina Reka protected area, 5 km NE Bulgari, 160 m a.s.l., 25.-28.06.2003, 4 ex.; Maleshevska Planina Mt.: W Gorna Breznitsa, 800-900 m a.s.l., 31.07.2002, 1 ex.; Manastir Gorna Breznitsa, 550 m a.s.l., 01.08.2002, 1 ex.; Sandanski-Petrich Valley: Chuyepetel north from Katountsi, 350 m a.s.l., 12.05.2002, 1 ex., leg. E. Migliaccio (EM); Sakar Mt.: Cherepovo, 42°00'14" N, 26°10'11" E, 456 m a.s.l., 21.06.2012, 1 ex., leg. T. Ljubomirov (VS); North Black Sea Coast: Staro Orjachovo, 28.06.2004; South Black Sea Coast: Achtopol, 02.07.2004, leg. W. Ziegler (Niehuis, p.c.).

***Meliboeus (Meliboeoides) parvulus* Küster, 1852**

**Material.** North Black Sea Coast: Albena, 28.06.2004, leg. W. Ziegler (Niehuis, p.c.).

**Remarks.** Sakalian 2003: 163 and Sakalian, Langourov 2007: 367 cited records pertaining to this species under name of junior synonym *M. violaceus*.

*Meliboeus (Meliboeus) episcopalis*  
(Mannerheim, 1837)

**Material.** Sandanski-Petrich Valley: Ilendenci, 450 m a.s.l., 31.05.2003, leg. Buchbach & Steidel; South Black Sea Coast: Sinemorets, 13.05.2002, leg. Schmitt; Primorsko, 27.06.2004 and 2.07.2004, leg. W. Ziegler (Niehuis, p.c.).

*Meliboeus (Meliboeus) graminis graminis*  
(Panzer, 1799)

**Material.** North Black Sea Coast: Albena, 28.06.2004; South Black Sea Coast: Sozopol, 01.-08.07.2004, leg. W. Ziegler (Niehuis, p.c.).

*Meliboeus (Meliboeus) subulatus* Morawitz, 1861

**Material.** Sandanski-Petrich Valley: Sheytan Dere, 5 km N from Kresna, 250 m a.s.l., 01.08.2002, 3 ex., leg. E. Migliaccio (EM).

**Tribe Tracheini Laporte, 1835**

*Trachys ahenatus* Mulsant & Rey, 1863

**Material.** South Black Sea Coast: Primorsko, 01.07.-02.07.2004; Road Ravadinovo-Sozopol, 03.07.2004, leg. W. Ziegler (Niehuis, p.c.).

*Trachys fragariae* Brisout de Barneville, 1874

**Material.** Maleshevska Planina Mt.: Tsaparevo, 480 m a.s.l., 02.-30.07.2002, 1 ex., leg. S. Lazarov & T. Ljubomirov; 5 km E from Igralishte, 730 m a.s.l., soil traps, 04.05.-04.07.2003, 1 ex., leg. T. Ljubomirov (VS).

*Trachys minutus minutus* (Linnaeus, 1758)

**Material.** Central Danubian Plain: Pleven: Kailuka, 30.04.2000, 1 ex., leg. M. Langourov; Sofia Plain: Bezden, 42°52'54"N, 23°05'55"E, 561 m a.s.l., 09.10.-07.11.2016, Malaise trap, 1 ex., leg. N. Karaivanov (VS); Osogovska Planina Mt.: Lisets, 04.08.2004, 2 ex., leg. D. Doychev (DD); South Black Sea Coast: Ropotamo protected area near Sozopol, 26.06.2003, 1 ex. leg. E. Migliaccio (EM); Achtopol, 02.07.2004, leg. W. Ziegler (Niehuis, p.c.).

*Trachys puncticollis rectilineatus*  
Abeille de Perrin, 1900

**Material.** Thracian Plain: SE Maluk Chardak, 42°16'44"N, 24°38'48"E, 198 m a.s.l., soil traps, 27.07.-26.08.2018, 1 ex., leg. T. Teofilova; North Black Sea Coast: Balchik, 43°23'49"N, 28°06'20"E, 217 m a.s.l., 12.-13.06.2018, yellow traps, 2 ex., leg. T. Ljubomirov (VS).

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