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Key for identification of the ladybirds (Coleoptera: Coccinellidae) of European Russia and Russian Caucasus (native and alien species)

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Abstract

Although ladybirds of European Russia and the Caucasus have been the subject of numerous ecological and faunistic investigations, there is an evident lack of appropriate identification key for them. All previous keys have been published in Russian. The most modern key was published more than 50 years ago and included only about 60 % of species. Guides for identification of Coccinellidae of other countries are not appropriate for European Russia, since do not include many species occurring in the regions. New, original key to subfamilies, genera, and species of ladybirds (Coccinellidae) of the European Russia and Russian Caucasus is presented. All native species recorded in the region and all alien species introduced to this region are included. Some species from the adjacent regions are added. In total, 110 species are keyed and illustrated with line drawings. Photographs of rare and endemic species are provided. Information on the distribution of species within the region under consideration is provided. Synonymy of *Chilocorus kuwanae* with *Ch. renipustulatus* is presented and discussed.

Key words: Ladybeetles, guide for identification, aborigenous species, introduced species.

Introduction

The family of ladybirds (Coccinellidae) includes more than 6000 species, distributed throughout the world (Vandenberg 2002). One hundred and five species have been recorded inEuropean Russia and Russian Caucasus (Zaslavski 1965; Iablokoff-Khnzorian 1983; Savojskaja 1984; Kovář 2007; Korotyaev *et al*. 2012).

Identification of Coccinellidae is very important, since this group is the subject of numerous ecological and faunistic investigations and because some species of ladybirds are used for biological control of pests. But there was no appropriate guide for identification of ladybirds of

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European Russia. At present, the main guide for identification of the adults of ladybirds of the European Russia and the Russian Caucasus is the key by Zaslavski (1965). However, this key includes only about 60% of species. It does not include some native species of the genera *Tetrabrachys*, *Ceratomegilla*, *Exochomus*, *Scymnus*, *Nephus*, *Hyperaspis* as well as allintroduced species(Orlova-Bienkowskaja & Bieńkowski 2017). During more than 50 years since the publication of the work by Zaslavski (1965), many changes in the nomenclature of ladybirds have been proposed, and new species have been described. Key to adults of ladybirds of the whole territory of the USSR is included in publications by Savojskaja (1983; 1984). However, these keys also include only part of the species occurring in European Russia and Russian Caucasus. All these keys have been published in Russian. Until now, there was no key in English. Guides for identification of Coccinellidae of other countries are not appropriate for European Russia, since do not include many species occurring in the Caucasus and other regions.

Materials and methods

The present key was compiled on the base of examination of about 2000 specimens from the Zoological Institute of Russian Academy of Sciences, Zoological Museum of the Moscow State University, Department of Entomology of the Moscow State University, collections of M.N. Tsurikov, A.G. Khizhniakova, and own author's collection.

The characters used in identification of genera and species of Coccinellidae are shown in Figure 1.

For each genus the number of species occurring in European Russia and Russian Caucasus is indicated. References to the taxonomic literature used when compiling the key for species of each genus are provided before the key. The valid names of genera and species are supplied with some invalid names in parentheses: first, the names used as valid ones by Zaslavski (1965), and secondly, other important synonyms.

Two asterisks (**) after the name of the species indicate that specimens from European Russia and Russian Caucasus have been examined, one asterisk (*) indicate that specimens from outside the region have been examined. The specific names in square brackets mean that these species have not been found in European Russia and in Russian Caucasus (5 species). The reason for the inclusion of them is indicated in each case.

Distribution of species within the region under consideration is indicated. The subdivision of the European Russia into the north, middle belt, and south is adopted according to a new Palaearctic

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62 catalogue (Kovář 2007). The border between the north and the middle belt is roughly along the
63 line St.-Petersburg–Vologda–Syktyvkar, and between the middle belt and south – the line
64 Kursk–Voronezh–Saratov–Orenburg.

65 The nomenclature of the names of genera, tribes and subfamilies is given according to Nedvěd
66 (2015).

67 **Key to genera**

68 1(2). Last antennomere very large, oval, as long as 7 previous ones combined. Head entirely
69 drawn into prothorax, bent down (Figure 2 A). Body small (length 2mm), very convex,
70 semisphaerical, shining. Head, pronotum and elytra covered by long sparse setae. Femora can be
71 embedded in impressions on underside of thorax and 1st abdominal sternite, covering tibiae and
72 tarsi by themselves. Subfamily Microweiseinae. ... 1. *Serangium* Blackburn (1 species introduced
73 from India).

74 2(1). Last antennomere not longer than 2 previous ones combined. Head not drawn into
75 prothorax.

76 3(4). Tarsi distinctly tetramerous; 3rd tarsomere not much less than 2nd (Figure 2 D). Subfamily
77 Coccidulinae (in part). ... 2. *Tetrabrachys* Kapur (*Lithophilus* Frölich) (4 species).

78 4(3). Tarsi pseudotrimerous; 2nd tarsomere enlarged below and projecting under 3rd one; 3rd
79 tarsomere small, attached on the upper side of 2nd one at its base and often poorly visible
80 (Figure 2 E).

81 5(8). Fore tibiae with apical spur (Figure 2 B). Dorsum always pubescent. Subfamily
82 Epilachninae.

83 6(7). Tarsal claw with denticle at mid-length (Figure 2 C). Elytral epipleura without impressions.
84 Elytra covered with punctures of the same size ... 3. *Subcoccinella* Guerin-Meneville (1 species).

85 7(6). Tarsal claw with denticle at base (Figure 2 J). Elytral epipleura with impressions, in which
86 apices of femora can be inserted (Figure 2 I). Elytra covered with punctures of different size:
87 sparse large and dense small ones ... 4. *Cynegetis* Dejean (1 species).

88 8(5). Fore tibiae without apical spur. Dorsum smooth or pubescent.

89 9(16). Clypeus very broad, forming large plate in front of eyes. (Figure 2 H).

90 10(15). Elytra smooth (with only fine, poorly visible setae at lateral side). Eyes smooth.
91 Subfamily Chilocorinae.

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11(12). Clypeus bordered anteriorly. Femoral line reaching posterior side of the sternite and then running along the latter in the outside (Figure 2 G) ... 5. *Chilocorus* Leach (3 species: two native and one introduced from the Far East).

12(11). Clypeus without anterior border. Femoral line forming 1/2 a circle and reaching anterior side of the sternite with its outer end (Figure 2 F).

13(14). Elytra spotted, dark with pale spots or rufous with black spots ... 6. *Exochomus* Redtenbacher (Brumus Mulsant) (3 species).

14(13). Elytra entirely black. Pronotum black medially and yellow laterally ... 7. *Parexochomus* Barovsky (2 species).

15(10). Elytra entirely covered with dense setae. Eyes covered with single long setae (more distinct at sides). Subfamily Scymninae (tribe Platynaspidini) ... 8. *Platynaspis* Redtenbacher (1 species).

16(9). Clypeus narrow, non-projecting in front of eyes (Figure 1 B: 1). Not to be confused with narrow lateral parts of frons behind antennal bases, which projecting on eyes!

17(38). Pronotum and elytra covered with dense setae.

18(23). Antennae long, reaching mid-length of pronotal lateral sides or extending further. Subfamily Coccidulinae (in part).

19(22). Body oblong or elongated oval.

20(21). Body oblong; elytra almost parallel-sided at mid-length (Figure 3 A). Elytral punctuation double, consists of small and large punctures; large punctures arranged in irregular rows (Figure 3 B). Pronotal base immarginate ... 9. *Coccidula* Kugelann (2 species).

21(20). Body elongated oval. Elytral punctuation double, consists of small and large punctures; large punctures irregularly placed. Pronotal base marginate ... 10. *Rhyzobius* Stephens (1 species).

22(19). Body short-oval or nearly round. Elytral punctures similar in size. Elytra entirely blackish bronze ... 11. *Lindorus* Casey (1 species introduced from Australia).

23(18). Antennae short, not reaching mid-length of pronotal lateral sides, if slightly projecting behind mid-length, then body very small, 1.5–1.6mm long (see couplet 25).

24(27). Lateral parts of prosternum in front of coxae are very narrow, much narrower than coxae (Figure 3 E).

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25(26). Setae at elytral apical slope directed parallel to suture. Elytra with whitish horseshoe shaped mark in the centre (Figure 8 J). Subfamily Scymninae (in part) ... 13. *Clitostethus* Weise (1 species).

26(25). Setae at elytral apical slope directed obliquely from suture. Elytra red with black pattern. Subfamily Ortaliinae ... 12. *Rodolia* Mulsant (2 introduced species).

27(24). Lateral parts of prosternum in front of coxae are more broad (Figure 3 C, D). There is no whitish horseshoe shaped mark on elytra. Subfamily Scymninae (in part).

28(37). Lateral parts of prosternum in front of coxae about as wide as coxa (Figure 3 C). Body smaller, 1–3mm long. Antennae shorter than head width.

29(30). Setae at elytral apical slope directed parallel to suture. Pronotum and elytra black; antennae, tibiae, and tarsi yellow ... 14. *Stethorus* Weise (2 species).

30(29). Setae at elytral apical slope directed obliquely from suture.

31(34). Prosternal process with 2 carinae (Figure 3 C).

32(33). Femoral line turned towards the anterior border of the sternite or reaching the latter ... 15. *Scymnus* Kugelann (in part) see also couplet 35. (25 species).

33(32). Femoral line reaching posterior side of the sternite and continuing along the latter ... 16. *Diomus* Mulsant (1 species).

34(31). Prosternal process without carinae.

35(36). Femoral line forming 1/2 a circle and reaching anterior side of the sternite with its outer end ... 15. *Scymnus* Kugelann (in part), see also couplet 32.

36(35). Outer part of femoral line running along posterior side of the sternite ... 17. *Nephus* Mulsant (6 species: 5 native, 1 introduced from Reunion Isl.)

37(28). Lateral parts of prosternum in front of coxae is very broad, 2X as wide as coxa (Figure 3 D). Body larger, 4.3-4.6mm long. Antennae longer than head width. ... 18. *Cryptolaemus* Mulsant (1 species introduced from Australia).

38(17). Pronotum and elytra smooth.

39(40). Elytral epipleura with impressions, in which apices of mid- and hind-femora can be inserted (Figure 3 F). Antennae shorter than head width. In male, head yellow, pronotum black with anterior and lateral sides yellow; in female, head black, pronotum black with lateral sides yellow. Subfamily Scymninae (in part) ... 19. *Hyperaspis* Chevrolat (*Oxynychus* LeConte) (7 species).

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40(39). Elytral epipleura without impressions. Antennae longer than head width. Subfamily Coccinellinae.

41(42). Femoral lines absent. Body oblong. Elytra yellow or rufous, usually with 13 black spots, which sometimes partly fused to each other, rarely without spots 20. *Hippodamia* Chevrolat (in part) (4 species).

42(41). Femoral lines present.

43(48). Pronotal base marginate (in *Ceratomegilla* this border sometimes interrupted at sides of middle).

44(47). Mid- and hind-tibiae with 2 long apical spurs.

45(46). Tarsal claws bifid at mid-length (Figure 3 J). Body oblong ... 20. *Hippodamia* Chevrolat (in part) (*Adonia* Mulsant) see also couplets 41 and 58 (4 species).

46(45). Tarsal claws with large denticle, raised from the base; apex of denticle reaching mid-length of claw (Figure 3 I). Body broadly oval ... 21. *Ceratomegilla* Crotch (*Semiadalia* Crotch) (4 species).

47(44). Mid- and hind-tibiae without apical spurs. Tarsal claw with denticle at base ... 22. *Aphidecta* Weise (1 species).

48(43). Pronotal base immarginate.

49(52). Tarsal claws without distinct denticle (claw sometimes broadened at inner edge near base) (Figure 3 K). In *Anisosticta* (couplet 50), very weak denticle (much more 90°) sometimes presents.

50(51). Body oblong-oval, weakly convex. Pronotum broadest at mid-length of lateral side (Figure 3 G). Mid- and hind-tibiae with 1 spur ... 23. *Anisosticta* Chevrolat (2 species).

51(50). Body short-oval, very convex. Pronotum broadest at base of lateral side (Figure 3 H). Mid- and hind-tibiae with 2 spurs ... 24. *Bulaea* Mulsant (1 species).

52(49). Tarsal claws with denticle (Figures 3 L, 4 D, E, G).

53(54). Elytral suture with pubescent excision near apex (Figure 4 A). Prosternum with tubercle anteriorly ... 25. *Anatis* Mulsant (1 species).

54(53). Elytral suture without excision near apex. Prosternum without tubercle.

55(86). Penultimate antennomere broader than long or as broad as long (Figures 4 B, H, K, L, 5 I).

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183 56(59). Femoral line forming even arc, with its outer end reaching anterior side of the sternite (in
184 *Adalia*, weakly developed posterior branch deviates from the arc at an angle, Figure 4 C).

185 57(58). Tarsal claws with denticle at base (Figure 4 D) ... 26. *Adalia* Mulsant (3 species).

186 58(57). Tarsal claws bifid at mid-length (Figure 4 E) ... 20. *Hippodamia* Chevrolat (in part)
187 (*Adonia* Mulsant), see also couplet 45.

188 59(56). Femoral line reaching posterior side of the sternite (Figure 4 F) and usually bearing a
189 branch directed forward and obliquely outside.

190 60(63). Anterior side of horizontal plane of mesosternum with deep emargination, limited by
191 border (Figure 4 I).

192 61(62). Last antennomere broadly truncate at apex. Elytra mostly rufous with white spots, only
193 in one Caucasian species they are black with variable yellow pattern ... 27. *Calvia* Mulsant (4
194 species).

195 62(61). Last antennomere rounded at apex. Elytra yellow with variable black pattern ... 28.
196 *Propylea* Mulsant (*Propylaea* Mulsant) (1 species).

197 63(60). Anterior side of horizontal plane of mesosternum straight or weakly impressed, but
198 always without deep triangular emargination (Figure 4 J). In some cases, mesosternum bearing
199 triangular emargination on its anterior slope (not at horizontal plane!) (Figure 5 E).

200 64(85). 1st antennomere not lobately broadened.

201 65(66). Tarsal claws with denticle at mid-length (Figure 4 G) ... 30. *Myzia* Mulsant (*Neomysia*
202 Casey) (1 species).

203 66(65). Tarsal claws with denticle at base (in some cases, large denticle raised from the base, and
204 its apex reaching mid-length of the claw).

205 67(70). Last antennomere oval, truncate apically, longer than wide (Figure 4 K).

206 68(69). Body smaller, 3–4 mm long. Each elytron with 6 pale spots ... 31. *Vibidia* Mulsant (1
207 species).

208 69(68). Body larger, 5–6 mm long. Each elytron with 10 pale spots ... 29. *Sospita* Mulsant (1
209 species).

210 70(67). Last antennomere as long as wide or wider than long (Figure 4 L).

211 71(78). Episterna of metathorax pale.

212 72(73). Elytra black, each with 7 large yellow spots ... 32. *Coccinula* Dobrzhanskiy (2 species).

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73(72). Elytra yellow or rufous, with black stripes or spots.

74(77). Elytral suture pale.

75(76). Body smaller, 3–4.5mm long. Pronotum with 5 black spots. Each elytron with 11 black spots ... 33. *Psyllobora* Dejean (*Thea* Mulsant) (1 species).

76(75). Body larger, 5–6.5mm long. Pronotum with 11 black spots, in some cases these spots are partly fused. Each elytron with 8 black spots or only 2 spots at lateral side ... 34. *Harmonia* Mulsant (in part), see also couplet 80. (2 species: 1 native and 1 introduced from E. Asia).

77(74). Elytral suture black, besides that each elytron with black longitudinal discal stripe or with 8 black spots, 3 lateral spots usually connected to each other ... 35. *Tytthaspis* Crotch (2 species).

78(71). Episterna of metathorax entirely or mostly black or brown.

79(82). Mesosternum bearing triangular emargination limited by borders on its anterior slope (Figure 5 E).

80(81). Elytral apical slope with transverse fold (Figure 5 A) ... 34. *Harmonia* Mulsant (in part), see also couplet 76.

81(80). Elytral apical slope without transverse fold ... 36. *Oenopia* Mulsant (*Synharmonia* Ganglbauer) (2 species).

82(79). Mesosternum without triangular emargination on its anterior slope.

83(84). Pronotal lateral side broadly bent, immarginate (Figure 5 G). Elytra red, without spots ... 37. *Cycloneda* Crotch (1 species introduced from Cuba for pest control in greenhouses).

84(83). Pronotal lateral side narrowly bent and marginate (Figure 5 H). Elytra with black spots or stripes ... 38. *Coccinella* Linnaeus (7 species).

85(64). 1st antennomere lobately broadened. (Figure 5 B) ... 39. *Aiolocaria* Crotch (1 species introduced in Ukraine and Georgia from E. Asia).

86(55). Penultimate antennomere longer than broad (Figure 5 C). Dorsum orange-brown with white spots.

87(88). Prosternal process with 2 lateral furrows, separating narrow external stripes (Figure 5 F). Body smaller, 3.5–4.6mm long ... 40. *Myrrha* Mulsant (1 species).

88(87). Prosternal process marginate at the very edge, without lateral furrows (Figure 5 D). Body larger, 5.8–6.4mm long ... 41. *Halyzia* Mulsant (1 species).

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Key to species

1. *Serangium* Blackburn

(Poorani 1998)

1(2). Eyes larger than in the next species, not widely separated; the narrowest distance between them is less than 2X as wide as eye (measured in the plane of frons). Male aedeagus: right paramere triangular. C. and S. India, introduced in N. America. Length 1.5-2.0mm ... [*S. parcesetosum* Sicard]

2(1). Eyes smaller than in the previous species, more widely separated; the narrowest distance between them is slightly more than 2X as wide as eye (measured in the plane of frons). Male aedeagus: right paramere broadly rounded. N. India, introduced in Russian Caucasus (Krasnodar Krai). In the Russian literature it is often mistakenly identified as *S. parcesetosum* (e.g., Timofeeva & Hoang Duc Nhuan 1978; Izhevsky 1990; Maslyakov & Izhevsky 2011). Length 1.5-2.0mm ... *S. montazerii* Fürsch **

2. *Tetrabrachys* Kapur

(Zaslavski 1965; Iablokoff-Khnzorian 1974; Savojskaja 1983)

1(6). Elytra narrowed toward humerae and distinctly narrower basally than the largest width of pronotum.

2(5). Femoral line distinctly angulate, reaching mid-length of the sternite. Elytra entirely black or with apex rufous or brown. Head black, pronotum, antennae and legs rufous. Body less convex.

3(4). Elytra entirely black or with apex brown, broadly rounded at apex. Lateral sides of pronotum evenly rounded (Figure 7 A). Length 2.5–3.7mm. Ukraine (Iablokoff-Khnzorian 1983) ... [*T. connatus* (Creutzer)] *

4(3). Elytra black with apical 1/4 rufous, slightly elongated at apex. Pronotum weakly cordate. Length 2.5–3.5mm. Crimea ... *T. tauricus* (Semenov) **

5(2). Femoral line arc-shaped, slightly not reaching mid-length of the sternite. Elytra black with large rufous spot at apex. Body more convex. Pronotum weakly cordate (Figure 7 B). Length 2.7–3.3mm. Figure 10 C. Crimea ... *T. weisei* (Reitter) **

6(1). Elytra with large humeral denticle, scarcely narrower basally than the largest width of pronotum, covered with very large, sparse punctures, black with large rounded yellow spot at apex. Femoral line arc-shaped, projecting beyond mid-length of the sternite. Length 3.0mm. Figure 10 D. Originally described on the base of 1 specimen from the Caucasus: Krasnodar Krai (Goryachy Kliuch), found repeatedly in W. Caucasus (Abago Mt.) (Zamotajlov & Nikitsky 2010) ... *T. arnoldii* (Iablokoff-Khnzorian) **

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279 3. *Subcoccinella* Guerin-Meneville

280 (Zaslavski 1965)

281 1(1). Dorsum rufous or orange, pronotum one-colored or with 1, 3 or 5 black spots, each elytron
282 with 12 black spots, sometimes partly fused, scutellum black. Length 3.4–4.5mm. Widely
283 distributed ... *S. vigintiquatuorpunctata* (Linnaeus) **

284

285 4. *Cynegetis* Dejean

286 (Zaslavski 1965)

287 1(1). Head and scutellum black, pronotum and elytra reddish-brown, pronotum sometimes with
288 black spot. Length 3.0–4.0mm. Middle belt (Smolensk reg.), south (Saratov reg.) (Iablokoff-
289 Khnzorian 1983) ... *C. impunctata* (Linnaeus) *

290

291 5. *Chilocorus* Leach

292 (Silvestri 1909; Kamiya 1959; Zaslavski 1965; Kuznetsov 1992)

293 1(2). Head, pronotum, and elytra black; each elytron with large, elongated, diffuse red spot,
294 occupying the most part of disc. Usually larger than other species, 5.3–7.4mm long. Introduced
295 in W. Caucasus from the Far East (Iablokoff-Khnzorian 1983), no current information on the
296 state of population ... *Ch. rubidus* Hope*

297 2(1). Elytra with small spots distinctly limited, or elytra without spots. Usually smaller, than
298 previous species, 2.7–6.0mm long.

299 3(6). Each elytron with 2–3 spots arranged in transverse row.

300 4(5). Body broadly oval. Pronotum and elytra dark brown or black; each elytron with transverse
301 row of 2–3 very small spots, which sometimes fused forming transverse band. Head rufous.
302 Length 3.0–4.2mm. Widely distributed ... *Ch. bipustulatus* (Linnaeus) **

303 5(4). Body wide-back-ovoid, triangularly narrowed in elytral apical 1/2 (Figure 7 C). Pronotum
304 and elytra black, sometimes with weak greenish or bluish tint; each elytron with transverse row
305 of 2 large, rounded rufous spots. Length 2.9–6.0mm. Introduced in Georgia from the Far East
306 (Maslyakov & Izhevsky 2011) ... [*Ch. infernalis* Mulsant (*bijugus* Mulsant)] *

307 6(3). Pronotum and elytra black; each elytron with 1 rounded or transverse red or rufous spot
308 (Figure 7 D), or spot absent (ab. *inornatus* Weise). Head black. Male aedeagus: medial piece
309 slightly shorter than parameres (Figure 7 E). Length 3.3–4.8mm. Widely distributed ... *Ch.*
310 *renipustulatus* (Scriba) ** (*kuwanae* Silvestri **syn. nov.**)

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Remark. *Ch. kuwanae* was originally described (Silvestri 1909) on the base of the specimens, received by the author from Japanese scientist Dr. Sh.I. Kuwana, for the introduction in Italy for control of the pest *Pseudaulacaspis pentagona*. Therefore, the type locality is probably Japan. Silvestri (1909) indicated the type locality as follows: "Cina e Giappone. Introdotto in Italia presso Acerra (Caserta)". The original description of *Ch. kuwanae* includes the following features of the new species to distinguish it from *Ch. renipustulatus*: body narrower and less convex, elytral spot smaller and less transverse, antennae longer, last maxillary palpomere narrower, punctuation of body more distinct. However, Silvestri (1909) has not studied any specimens of *Ch. renipustulatus*, but mentioned the characters of the latter after Ganglbauer (1899) and Mulsant (1846).

Kamiya (1959) in the revision of Chilocorinae from Japan mentioned that *Ch. kuwanae* differs from both, *Ch. renipustulatus* and *Ch. similis* by the punctuation of head and shape of scutellum. This author noted the following features of *Ch. kuwanae*: head with strong and very close but not deep setigerous punctures; interspaces between the punctures on frons and vertex shagreened; scutellum flat, with fine punctures; elytral marking very small, transverse or sometimes rounded.

Savoyskaya (1984) indicated the following distinguishing characters: for *Ch. kuwanae* – male aedeagus with medial piece distinctly shorter than parameres, elytra with very small transverse, sometimes rounded spot; for *Ch. renipustulatus* – elytra with large, transverse, usually kidney-shaped spot. *Ch. renipustulatus* included by Savoyskaya (1984) in the group of the species in which male aedeagus with medial piece slightly shorter than parameres, or longer than parameres, or as long as the latters.

Kuznetsov (1992) separated these taxa as follows: in *Ch. renipustulatus* elytron with large kidney-shaped spot; elytra finely and densely punctate; body 2.7–3.7mm long; in *Ch. kuwanae* elytron with very small transverse spot; elytra finely and sparsely punctate; body 3.5–4.8mm long.

I examined 26 specimens from the area of *Ch. renipustulatus* (European Russia: Karelia, Moscow reg., Ryazan reg., Kaliningrad reg., Lipetsk reg.), Slovakia, Germany, Georgia, Ukraine (Transcarpathian reg.), Russian Caucasus (Krasnodar Krai, Stavropol Krai), W. Siberia (Khanty-Mansiysk Autonomous Okrug), and 6 specimens from the native area of *Ch. kuwanae* (Sakhalin Isl., Japan: Honshu Isl.). As a result, I established that aedeagus is absolutely similar in the males from the areas of *Ch. renipustulatus* and *Ch. kuwanae*. Shape and size of elytral spot vary in different specimens, but do not represent geographical difference. Punctation of head, scutellum, and elytra, size and proportions of body do not differ geographically in the specimens being at my disposal. In the specimens from Japan and Sakhalin Isl., frons is distinctly microsculptured;

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in the European specimens, this character varies: frons is usually smooth, and more rarely with obsolete or distict microsculpture. The last character may indicate on intraspecific geographical difference, but not separate species. Therefore, I cosider the name *Ch. kuwanae* to be an junior synonym of *Ch. renipustulatus*.

6. *Exochomus* Redtenbacher

(Zaslavski 1965; Biranvand *et al*. 2017)

1(4). Background of pronotum and elytra black.

2(3). Each elytron with 2 separate rufous spots: the former falciform at humerus, the latter rounded or irregular, transverse, placed behind the mid-length. Body almost round. Medial piece of aedeagus is shorter than parameres. Length 3.0–5.0mm. Widely distributed ... *E. quadripustulatus* (Linnaeus) **

3(2). Each elytron with 1 large brown or orange irregular spot. Body broadly oval. Medial piece of aedeagus is longer than parameres. Length 4.3–5.0mm. South (Karachay-Cherkessia, Daghestan) (Iablokoff-Khnzorian 1983) ... *E. undulatus* Weise

4(1). Pronotum and elytra entirely rufous or reddish-brown, or with small black spots.

5(6). Pronotum with black spot at the middle of base, each elytron with 4 black spots, scutellum black. Medial piece of aedeagus as long as parameres. Length 2.8–4.5mm. South ... *E. octosignatus* (Gebler) **

6(5). Elytra brown, without spots. See also couplet 2 ... *E. quadripustulatus* (Linnaeus) **

7. *Parexochomus* Barovsky

(Zaslavski 1965)

1(2). Elytra pure black. Pronotum and elytra smooth, without setae. Larger than the next species. Length 3.2–3.4mm. Widely distributed ... *P. nigromaculatus* (Goeze) (*flavipes* auct. nec Thunberg) **

2(1). Elytra black with blue tint. Pronotum and lateral sides of elytra covered with sparse white adpressed setae. Smaller than the previous species. Length 2.4–2.6mm. South (Crimea, Krasnodar Krai, Astrakhan reg., Kalmykia) ... *P. melanocephalus* (Zoubkoff) **

8. *Platynaspis* Redtenbacher

(Zaslavski 1965)

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1(1). Head black or yellow; pronotum black with wide yellow lateral stripe, not reaching posterior angles; elytra black, each with 2 rufous spots. Length 2.5–3.5mm. Widely distributed ... *P. luteorubra* (Goeze) **

9. *Coccidula* Kugelann

(Zaslavski 1965)

1(2). Dorsum red with scutellum black. Humerae slightly projecting laterally. Length 2.6–3.7mm. Widely distributed ... *C. rufa* (Herbst) **

2(1). Dorsum rufous, elytra with common black spot at base (sometimes absent), each elytron with 2 black spots, sometimes fused to each other, scutellum black. Humerae greatly projecting laterally. Length 3.0–3.6mm. Middle belt, south ... *C. scutellata* (Herbst) **

10. *Rhyzobius* Stephens

(Zaslavski 1965)

1(1). Body oval. Dorsum rufous, elytra with variable black pattern, usually with irregular longitudinal spots along lateral side, which reaching suture at elytral apical slope. Length 3.0–3.3mm. North (Leningrad reg.)?, middle belt (Smolensk reg.)? (Iablokoff-Khnzorian 1983) ... *Rh. chrysomeloides* (Herbst) *

11. *Lindorus* Casey

(Lompe 2002)

1(1). Head rufous, pronotum entirely rufous or with black spot at middle, elytra blackish bronze. Length 2.1–2.5mm. Figure 11 D. Introduced at Black Sea coast of the Caucasus, occurs in Sochi ... *L. lophanthae* (Blaisdell) **

12. *Rodolia* Mulsant

(Savojskaja 1983; Leeper 2015)

1(1). Dorsum purplish red with black pattern: head, pronotal base and scutellum black, elytra with common spot behind scutellum, each with 4 spots, usually fused to each other. Length 2.0–4.0mm. Introduced at Black Sea coast of the Caucasus (Iablokoff-Khnzorian 1983) from Australia. No current information on the state of population ... *R. cardinalis* (Mulsant) *

2(1). Elytra entirely pink-red, rarely black. Introduced in European Russia from Middle Asia (Izhevsky 1990). No current information on the state of population ... *R. fausti* (Weise)

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411

412 13. *Clitostethus* Weise

413 (Zaslavski 1965)

414 1(1). Head rufous or yellow; pronotum yellow; elytra rufous with common black spot before the
415 mid-length (this spot sometimes separated in right and left parts), this spot marginate laterally
416 and posteriorly with pale yellow horseshoe stripe; besides that, elytra with common arc-shaped
417 pale yellow band at apical slope (this band sometimes absent) (Figure 8 J). Length 1.5–1.6mm.
418 South (Crimea, Krasnodar Krai) ... *C. arcuatus* (Rossi) **

419

420 14. *Stethorus* Weise

421 (Kapur 1948; Zaslavski 1965)

422 1(2). Head black or brown, with mouth parts yellow. Femora black with apices yellow. Femoral
423 line arc-shaped, reaching mid-length of the sternite. Male aedeagus: parameres scarcely shorter
424 than medial piece. Length 1.3–1.5mm. Widely distributed ... *S. pusillus* (Herbst) (*punctillum*
425 Weise) **

426 2(1). Head black with anterior 1/2 yellow. Femora yellow. Femoral line arc-shaped, reaching 2/5
427 of the sternite length. Male aedeagus: parameres as long as 2/3 of medial piece. Length 1.3–
428 1.4mm. South (Astrakhan, Daghestan) ... *S. gilvifrons* (Mulsant) **

429

430 15. *Scymnus* Kugelann

431 (Lompe 2002; Nedvěd 2015).

432 Three species, *S. pallipes* Mulsant, *S. testaceus* Motschulsky, *S. sangtanabiensis*
433 Bielawski, 1959 were recorded from N. Caucasus (Iablokoff-Khnzorian 1983) but not included
434 in the key below. *S. pallipes* is distributed in Central Asia, its finding in Russian Caucasus is
435 doubtful. *S. testaceus* is not sufficiently studied, probably conspecific with *S. limbatus*. *S.*
436 *sangtanabiensis* is a rare species described from Afghanistan, its occuring in Russian Caucasus
437 is should be confirmed.

438 1(40). Femoral line incomplete: outer end not reaching anterior border of the sternite. Antennae
439 11-segmented in most species (10-segmented in *S. silesiacus*, couplet 5).

440 2(17). Elytra one-colored.

441 3(8). Elytra brown or brownish-yellow.

442 4(7). Body smaller (length 1.5–2.2mm), broadly oval.

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5(6). Elytra very densely and finely punctate with sparse large punctures on finely punctate background. Body less convex, than in *S. abietis*. Antennae 10-segmented. Length 1.8–2.0mm. Crimea: Yalta (Iablokoff-Khnzorian 1983) ... *S. silesiacus* Weise

6(5). Elytra with double punctation: rows of large puctures can be traced at finely and densely punctate background. Antennae 11-segmented. See also couplet 26 ... *S. interruptus* (Goeze)

7(4). Body larger (length 2.2–3.0mm). Oblong oval. Elytra rather evenly punctate. Body brownish-yellow, convex. North, Middle belt ... *S. abietis* (Paykull) **

8(3). Elytra black.

9(10). Legs entirely black or with tarsi brown. Elytra black, sometimes with metallic tint. Femoral line complete in some specimens. Length 2.1–2.2 mm. Widely distributed ... *S. nigrinus* Kugelann **

10(9). Legs at least partially pale.

11(14). Femora brown or black.

12(13). Body elongated oval. See also couplets 32 and 36 ... *S. frontalis* (Fabricius), black variation

13(12). Body broadly oval. Legs dark for the most part. Length 2.0–3.0mm. See also couplets 29 and 34 ... *S. apetzi* Mulsant, black variation

14(11). Legs pale, with only base of femora darkened in some cases.

15(16). Body elongated oval. Elytra often with brownish apical edge. Length 2.0–3.3mm. See also couplet 21 ... *S. mimulus* Capra et Fuersch, black variation

16(15). Body broadly oval, rather convex. In male head rufous, pronotum rufous with black spot at middle of pronotal base, in female head black with labrum yellow, pronotum black. Antennae and mouth parts yellow. This species differs from *S. auritus* in apical edge of elytra dark. Length 2.2–2.5mm. Widely distributed ... *S. rubromaculatus* (Goeze) **

17(2). Elytra with spots.

18(33). Each elytron with 1 spot.

19(20). Pale-yellow or orange spot is located in posterior 1/2 of elytron, sometimes diffuse. Body broadly oval, densely covered with yellow or white setae. In male head and anterior-lateral parts of pronotum red; in female head and pronotum black, with only labrum rufous. Legs entirely rufous, or with femora darkened. In male 5th abdominal sternite slightly emarginate and distinctly impressed at apex, this impression reaching mid-length of the sternite, densely pubescent. Aedeagus – Figure 6 L. Length 2.4–2.5mm. North (Leningrad reg.) ... *S. jakowlewi* Weise**

20(19). Pale spot is located at mid-length or in anterior 1/2 of elytron.

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21(22). Aedeagus – Figure 6 A. In male 5th abdominal sternite with broad and deep emargination. Body black, with head and mostly pronotal anterior angles reddish-yellow. Antennae, mouth parts and legs red. Femora more or less darkened. Elytron with large red spot, not including epipleura. This species differs from *S. frontalis* in elytral puncture rows which can be traced at densely and minutely punctate background. Length 2.4mm. See also couplet 15. Middle belt (Moscow reg.) ... *S. mimulus* Capra et Fuersch **

22(21). Aedeagus different.

23(30). Body broadly oval.

24(27). Elytron with large red-yellow spot, spreading on epipleura. In male head and pronotal anterior angles red-yellow, in female head black with labrum yellow, pronotum black.

25(26) Legs yellowish-brown. Elytra with large punctures. Apex of elytra with pale margin. More than 1/2 of epipleura red-yellow. Length 2.0-2.8mm. Crimea. (Iablokoff-Khnzorian 1983) ... *S. marginalis* (Rossi)

26(25) Legs red-yellow with femora partially darkened. Elytra with rows of large punctures at background densely and finely punctate. Apex of elytra black. Less than 1/2 of epipleura red-yellow. Aedeagus – Figure 6 F. Length 1.5–2.5mm. See also couplet 6. Middle belt (Moscow reg.), south (Crimea, southern Volga river basin, Krasnodar Krai) ... *S. interruptus* (Goeze) **

27(24). Elytron with red-yellow spot, not spreading on epipleura.

28(29). Medial piece of aedeagus slightly longer than parameres (Figure 6 C). Very close to *S. apetzi*, but body more elongate, elytra with punctures larger than those on pronotum, humeral callus weaker. Tibiae dark or pale. Length 2.4mm. Crimea (Evpatoria) ... *S. pallipediformis* Guenther (*apetzoides* Capra et Fuersch) **

29(28). Medial piece of aedeagus shorter than parameres (Figure 6 B). In male anterior part of head pale, vertex black; in female head black with only labrum pale. Pronotum usually with pale anterior angles. Legs entirely dark, or, at least, with mid- and hind-legs dark. 5th abdominal sternite with broad and deep emargination. See also couplets 13 and 34. South (from Saratov to Crimea and Caucasus) ... *S. apetzi* Mulsant**

30(23). Body elongate.

31(32). Aedeagus – Figure 6 G. Mid- and hind-tibiae curved. Pronotum with anterior and lateral sides yellow-red. In male 5th abdominal sternite strongly emarginate at apex. Variation with 2 spots on each elytron is more common. Length 2.0–3.0mm. See also couplet 39. South (Rostov reg., Stavropol Krai) ... *S. doriae* Capra **

32(31). Aedeagus – Figure 6 H. Mid- and hind-tibiae not curved. Head red in male, black in female (at most anteriorly red). Pronotum usually with anterior and lateral sides red, rarely entirely black. Legs red, sometimes with darkened femora. In male 5th abdominal sternite with

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broad and deep emargination and impression before emargination. Variation with 2 spots on each elytron is common, those with elytra entirely black is rare. Length 2.0–3.0mm. See also couplets12 and 36. Widely distributed ... *S. frontalis* (Fabricius) **

33(18). Each elytron with 2 spots. Anterior and posterior spots sometimes narrowly connected to each other or spreading at most part of elytron.

34(35). Broadly oval. In male head is just anteriorly yellow. See also couplets 13 and 29 ... *S. apetzi* Mulsant

35(34). Elongated oval. In male head entirely pale.

36(37). Medial piece of aedeagus very broad at base. See also couplets 12 and 32 ... *S. frontalis* (Fabricius), variation with 4 spots

37(36). Medial piece of aedeagus not broadened at base.

38(39). Medial piece of aedeagus slightly longer than parameres, broad (in ventral view), 2X as long as wide (Figure 6 M). Length 2.0–2.4mm. South (Crimea, Stavropol Krai, Krasnodar Krai, southern Volga river basin) ... *S. inderihensis* Mulsant**

39(38). Medial piece of aedeagus distinctly longer than parameres (Figure 6 G), narrow (in ventral view), 3X as long as wide. Length 2.0–3.0mm. See also couplet 31 ... *S. doriae* Capra **

40(1). Femoral line complete: its outer end reaching anterior border of the sternite.

41(55). Antennae 11-segmented. Dorsal coloration very variable.

42(47). Elytra differently colored: 1) entirely black or dark brown, 2) black with posterior margin reddish, 3) black with large red apical spot.

43(44). Elytra entirely black, without reddish apical margin. Pronotum, antennae, and legs red. Dorsum covered with dense and deep punctures. Femoral line arc-shaped, its arc reaching 3/4 of length of the sternite. Length 0.9–1.1mm. This species is similar with *S. ater* and differs by the body more elongated and antennae 11-segmented. North (Kola Penins.) (Iablokoff-Khnzorian 1983) ... *S. fennicus* Sahlberg

44(43). Elytra black with only apical margin narrowly reddish, or with apical part mostly reddish.

45(46). Elytra black, with large, well limited reddish spot in posterior part. All abdominal sternites red-yellow, or with only 1st sternite black. Elytra evenly punctate. Pronotum red with large black spot at middle of the base. Length 2.5–3.0mm. Aedeagus – Figure 6 I. This species is similar in color to *S. haemorrhoidalis*, and differs in body size, color of abdominal sternites, and antennae 11-segmented. Widely distributed ... *S. ferrugatus* (Moll) **

46(45). Elytra black with apical margin reddish. Broadly oval. 4th and 5th abdominal sternites reddish. Head usually reddish in both sexes, sometimes black in female. In male pronotum red with dark spot at middle of the base, this spot rarely absent, in female pronotum black. Antennae,

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maxillary palpi, and legs yellow-brown, at most femora blackish basally. Arc of femoral line almost reaching posterior border of the sternite. Length 2.0–2.5mm. Widely distributed ... *S. auritus* Thunberg **

47(42). Elytra brown with spotted pattern, or entirely pale.

48(49,50). Elytra brown, each usually with 4 black spots: 1st at humerus and elytral base, 2nd at lateral side near mid-length, 3rd at middle of disc, 4th on suture, forming sutural stripe (Figure 8 G). Length 1.6mm. South (Daghestan) (Iablokoff-Khnzorian 1983) ... *S. argutus* Mulsant*

49(48,50). Elytra entirely pale. Humeral callus indistinct. Aedeagus – Figure 6 D. Length 1.0–1.8mm. South (Crimea, Ciscaucasia, Krasnodar Krai, Volgograd). See also couplet 52 ... *S. marinus* (Mulsant) (*mediterraneus* Iablokoff-Khnzorian) **

50(48,49). Elytra dark brown, each with 2 pale spots, located one after another, or apical part of elytron with very large pale spot, occupying most of the surface.

51(54). Elytra pale with common dark basal spot, projecting back along suture.

52(53). Body weakly convex, with indistinct humeral callus. Length 1.0–1.8mm. See also couplet 49 ... *S. marinus* (Mulsant)

53(52). Very convex, with distinct humeral callus. Length 1.8mm. Widely distributed ... *S. suturalis* Thunberg **

54(51). Elytra dark brown, each with 2 transverse rufous spots, located one after another. Head and pronotal lateral sides (or only anterior angles) pale, antennae, maxillary palpi and legs rufous, femora rufous or darkened. Color variable. Body broadly oval; elytra usually with weak, but distinct outer apical angle, i.e. elytra is not evenly narrowed behind their mid-length to sutural angle. Length 1.9–2.5mm. South (Crimea, Caucasus, southern Volga river basin north to Saratov) ... *S. subvillosus* (Goeze) **

55(41). Antennae 10-segmented.

56(57). Body covered by arched setae. Body brown or blackish, elytra with diffuse black sutural and lateral stripes, the latter sometimes developed only at mid-length. Aedeagus – Figure 6 J. Length 1.7–2.0mm. Widely distributed ... *S. limbatus* Stephens**

57(56). Body covered by non-arched setae.

58(59). Elytra black, without pale apical margin. Pronotum black. Antennae, maxillary palpi, tarsi and sometimes tibiae brown. Body elongated oval, convex, covered with sparse white setae. Head and pronotum covered with fine punctures, elytra covered with rather strong punctures. Arc of femoral line reaching 2/3 of the length of the sternite. This species looks like *Stethorus punctillum* and differs in setae at elytral apical slope which are directed obliquely from the suture. Length 1.0–1.5mm. Widely distributed ... *S. ater* Kugelann **

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581 59(58). Elytra black, with large, indistinctly limited yellow-red spot, occupying the whole apical
582 part. In both sexes, pronotum red with large black spot at middle of the base. 1st–3rd abdominal
583 sternites black, 4-5th - red. Elytra with uneven punctation: rows of large punctures can be traced
584 at densely finely punctate background. Aedeagus – Figure 6 K. Length 1.5–2.3mm. Widely
585 distributed ... *S. haemorrhoidalis* Herbst **

586

587 16. *Diomus* Mulsant
588 (Eizaguirre 1998)
589 1(1). Body brown, with mouth parts, labrum, legs, and large spot in elytral apical 1/2 rufous.
590 Length 1.5–1.6mm. South (Crimea, southern Volga river basin, Daghestan) ... *D. rubidus*
591 Motschulsky**

592

593 17. *Nephus* Mulsant
594 (Weise 1879; Chazeau *et al*. 1974)
595 1(2,3). Elytra entirely black or brown. Length 1.5–1.8mm. Widely distributed ... *N.*
596 *redtenbacheri* (Mulsant) **
597 2(1,3). Elytra red-brown, with common dark spot in anterior 1/2, this spot narrowed towards the
598 elytral apex and sometimes indistinct. Pronotal disc dark. Femoral line incomplete, broadly arc-
599 shaped. Length 1.9–2.7mm. South (Crimea) (Iablokoff-Khnzorian 1983) ... *N. ludyi* (Weise)
600 3(1,2). Elytra black or dark brown with pale spots.
601 4(7). Each elytron with 2 yellow spots.
602 5(6). Anterior elytral spot elongated, kidney-shaped, beginning behind humeral tubercle and
603 running diagonally back to suture. Posterior elytral spot transverse, kidney-shaped. Dark brown
604 or black, elytral apex with narrow yellow edging, mouth parts, legs, and antennae yellow-brown;
605 in male pronotum with very narrow pale edging anteriorly. Aedeagus: medial piece with large
606 projection at base (viewed laterally). Length 1.5–2.0mm. Middle belt (forest and forest-steppe
607 zones) (Iablokoff-Khnzorian 1983) ... *N. quadrimaculatus* (Herbst)
608 6(5). Anterior elytral spot oval, less diagonal than in previous species; posterior elytral spot oval,
609 diagonal (Figure 8 I). Brown-black, with clypeus and 2 spots on each elytron light orange; elytral
610 apical margin pale, mouth parts and legs pale. Aedeagus: medial piece without projecting at base
611 (viewed laterally) (Figure 6 E). Length 1.6–1.9mm. Introduced at Black Sea coast of the
612 Caucasus (Maslyakov & Izhevsky 2011). No current information on the state of population ... *N.*
613 *reunioni* (Fuersch)
614 7(4). Each elytron with 1 spot.

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8(9,10). Elytral spot placed in anterior 1/2. Length 1.5–2.0mm. See also couplet 5 ... *N. quadrimaculatus* (Herbst)

9(8,10). Large longitudinal pale spot occupying almost whole elytral length. Body convex. Antennae and mouth parts rufous, legs entirely rufous, or with femora darkened. Length 1.3–1.8mm. See also couplet1 ... *N. redtenbacheri* (Mulsant)

10(8,9). Elytral spot placed in posterior 1/2.

11(12). Body convex, black or brown; with very narrow yellow-red stripes on pronotal anterior margin and elytral apical margin, and with large yellow-red spot in elytral posterior 1/2. Length 1.5–2.2mm. Middle belt, South (Crimea, Caucasus) ... *N. bipunctatus* (Kugelann) **

12(11). Body weakly convex, flattened. Coloration as in *N. bipunctatus*. Length 1.6–2.0mm. Southern European Russia, Krasnodar Krai ... *N. biflammulatus* (Motschulsky) **

18. *Cryptolaemus* Mulsant

(Savojskaja 1983)

1(1). Head, antennae, prosternum, pronotum, abdominal sternites, spot at elytral apex rufous; pronotal base medially darkened; elytra (except the apex), meso- and metasternum, and legs black. Body covered with dense light yellow setae. Length 6.0mm. Figure 11 A. Introduced in Black Sea coast of the Caucasus, reared and applied in Sochi by seasonal colonization ... *C. montrouzieri* Mulsant**

19. *Hyperaspis* Chevrolat

(Zaslavski 1965)

1(14). Tarsal claws with denticle near base. Elytra entirely black, or black with yellow spots.

2(3). Each elytron with small transverse yellow spot at base, triangular spot at mid-length, and larger oval spot at apex (Figure 8 H), the last two spots sometimes connected to each other or fused forming large longitudinal spot. Length 3.0–3.3mm. Middle belt (Samara), south, Ural Mts. (Ekaterinburg) ... *H. effusa* Weise**

3(2). Small transverse yellow spot at elytral base is absent.

4(13). Elytra with yellow spots.

5(10). Each elytron with 1 spot.

6(7). Yellow spot located just behind the mid-length of elytron. Body broadly oval. Length 2.7–3.3mm. Widely distributed ... *H. campestris* (Herbst) **

7(6). Yellow spot located near posterior side of elytron.

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8(9). Body elongated oval (Figure 7 F). Length 2.7–3.2mm. Widely distributed ... *H. reppensis* (Herbst) **

9(8). Body broadly oval (Figure 7 G). Length 3.1mm. North (St.-Petersburg), middle belt (Moscow and Orel reg.) ... *H. inexpectata* Guenther (*concolor* Suffrian) **

10(5). Each elytron with 2 spots.

11(12). One large, roundly quadrangular spot located at elytral mid-length; next smaller, roundly-triangular spot – at elytral apical slope (Figure 8 A). Length 2.6–3.0mm. Figure 10 B. South ... *H. desertorum* Weise **

12(11). One small, rounded spot located at elytral mid-length; next larger spot – at elytral apical slope (Figure 8 B). Length 3.1–3.3mm. Figure 11 B. South (Crimea, Krasnodar Krai, Daghestan, southern Volga river basin) ... *H. femorata* Motschulsky **

13(4). Elytra entirely black, without spots. Length 3.1mm. See also couplet 9 ... *H. inexpectata* Guenther (*concolor* Suffrian) **

14(1). Tarsal claws without denticle. Elytra black, each with 3 yellow spots; underside of body and femora black, prothoracic hupomera yellow, tibiae and tarsi rufous. Length 3.2–3.4mm. Middle belt, south ... *H. erythrocephala* (Fabricius) **

20. *Hippodamia* Chevrolat

(Zaslavski 1965)

1(4). Femoral lines absent.

2(3). Pale lateral stripe of pronotum broad, with small black spot in middle. Tibiae yellow. Sutural angle of elytron rectangular. Length 4.5–7.0mm. Widely distributed ... *H. tredecimpunctata* (Linnaeus) **

3(2). Pale lateral stripe of pronotum narrow, without black spot. Tibiae black with apex rufous. Sutural angle of elytron acute. Length 5.0–7.0mm. North, middle belt ... *H. septemmaculata* (DeGeer) **

4(1). Femoral lines present.

5(6). Base of pronotum marginate. Pronotum white, with transverse black basal spot, from which 4 projections running forward, this black spot sometimes broadened and occupying most of pronotal surface. Elytra yellow or orange, with common black spot near scutellum, each with 4–6 black spots. Length 3.9–5.5mm. Middle belt, south ... *H. variegata* (Goeze) **

6(5). Base of pronotum non-marginate. Pronotum white, with large bilobate black spot. Elytra yellow with black pattern. Length 4.4mm. North (Iablokoff-Khnzorian 1983) ... *H. arctica* (Schneider) *

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682

683 21. *Ceratomegilla* Crotch

684 (Dobzhansky 1927; Zaslavski 1965; Kuznetsov 1992)

685 1(2). Elytral background black. Each elytron with 7 yellow spots: 4 along suture, and 3 at lateral
686 side (Figure 7 H). Length 5.1mm. Figure 11 C. South ... *C. schneideri* (Weise) **

687 2(1). Elytral background yellow, orange, or red.

688 3(4). Pronotum black with large white spots in anterior angles and sometimes with very narrow
689 white stripe at anterior margin, bearing very small angular projection in the middle. Elytra
690 orange or red, with common longitudinal or triangular black spot near scutellum, each elytron
691 usually with 3 rounded black spots: one on humeral callus, two behind mid-length, sometimes
692 with one more very small spot at elytral lateral margin and very rarely with one spot at apical
693 slope. This species externally looks like *Coccinella septempunctata* and differs in the location of
694 anterior elytral spot: it placed behind humeral callus at large distance in *C.septempunctata*, and
695 directly on humeral callus in *C. undecimnotata*. Length 5.0–7.0mm. Aedeagus: apical appendage
696 of medial piece elongated, 3–4 X as long as wide. Widely distributed ... *C. undecimnotata*
697 (Schneider) **

698 4(3). Pronotum black with white or yellow stripe at anterior margin and anterior 1/2 of lateral
699 sides. White (yellow) anterior stripe bearing 3 angular projections (if these projections weakly
700 developed, then each elytron with 6 spots).

701 5(8). Pronotal and elytral punctures not differ in size and density.

702 6(7).Fore-tibiae black with underside rufous. 1st hind-tarsomere black. Elytra yellow (rarely
703 orange) with 11 black spots: common bilobed spot near scutellum, each with 5 spots, of which 2
704 inner ones are larger than 3 outer ones. Length 4.5–6.2mm. Aedeagus: apical appendage of
705 medial piece elongated, 3–4 X as long as wide. North, middle belt, south (Saratov reg.), S. Urals
706 (Chelyabinsk reg.) ... *C. notata* (Laicharting) **

707 7(6). Fore-tibiae and 1st hind-tarsomere rufous. Coloration as in previous species. Length 5.0–
708 6.0mm. South (Ciscaucasia, Daghestan) (Iablokoff-Khnzorian 1983) ... *C. apicalis* (Weise)

709 8(5). Elytra stronger and denser punctate than pronotum. Elytra orange, with 5–11 black spots;
710 the following spots always present: one spot on humerus and one large spot at disc, others much
711 smaller than the first two and sometimes absent. Aedeagus: apical appendage of medial piece
712 short, 1.5X as long as wide. South (Kuban) (Iablokoff-Khnzorian 1983). Length 4.9–5.9mm.
713 This species externally looks like *C. undecimnotata* and differs in pattern on pronotum, shape of
714 body (more elongated and less convex), stronger and denser elytral punctation, aedeagus
715 structure, and coloration of female head: black with transverse rufous band in *C. shelkovnikovi*,

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716 and black with rufous spots near eyes in *C. undecimnotata*. South (Kabardino-Balkaria, North
717 Ossetia) (Dobzhansky 1927) ... *C. shelkovnikovi* (Dobzhansky)
718 Remark. The name *schelkovnikovi* (Iablokoff-Khnzorian 1983; Kovář 2007) is an incorrect
719 subsequent spelling of the name *shelkovnikovi*.

720

721 22. *Aphidecta* Weise
722 (Zaslavski 1965)
723 1(1). Dorsum yellow; pronotum with black M-shaped pattern; elytra with black suture, usually
724 without spots, rarely with black spots, or entirely dark. Length 3.5–5.0mm. Widely distributed ...
725 *A. obliterata* (Linnaeus) **

726

727 23. *Anisosticta* Chevrolat
728 (Zaslavski 1965)
729 1(2). Dorsum yellow; head with 2 black spots on vertex; pronotum with 6, each elytron with 10
730 black spots. Length 3.4–4.4mm. North, middle belt, south (Crimea, Caucasus) ... *A.*
731 *novemdecimpunctata* (Linnaeus) **
732 2(1). Head black for the most part; pronotum yellow with 2 large black spots, elytra yellow with
733 black pattern: common undulate sutural stripe, each with longitudinal discal undulate stripe and
734 rounded spot at apical slope. Length 2.5–3.2mm. Figure 10 A. North ... *A. strigata* (Thunberg) **
735
736 24. *Bulaea* Mulsant
737 (Zaslavski 1965)
738 1(1). Head and pronotum pale yellow, elytra pink or pale rufous. Head with 2 spots, pronotum
739 with 1 small spot at middle of base (sometimes absent) and 6 large spots black. Elytra with
740 common spot near scutellum and each with 9 spots black. Length 3.5–5.5mm. South ... *B.*
741 *lichatschovi* (Hummel) **

742

743 25. *Anatis* Mulsant
744 (Zaslavski 1965)
745 1(1). Head black with 2 yellow spots on vertex. Pronotum black with yellow pattern: narrow
746 anterior and broad lateral stripes, 2 spots at base, lateral stripe including black spot. Elytra
747 yellow or orange, with narrow lateral stripe and 1, 5, 8 or 10 spots black. Each elytral spot
748 usually surrounded by light yellow ring; sometimes black spots absent, and only light yellow

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749 traces of spots present. Length 7.6–9.3mm. North, middle belt, south (Saratov reg.) ... *A. ocellata*
750 (Linnaeus) **

751

752 26. *Adalia* Mulsant
753 (Zaslavski 1965)
754 1(2). Epimera of mesothorax white. Elytra usually with transverse fold at apical slope. Dorsal
755 coloration very variable. Head usually pale yellow with 2 black spots; pronotum pale yellow or
756 white with 5 black or brown spots; elytra differently colored: 1) orange, each with 5–7 black
757 spots, sometimes connected to each other (Figure 8 D), or 2) rufous, each with 5 white (light
758 yellow) spots (Figure 8 C). Length 3.5–5.0mm. Middle belt (north to taiga), south (Crimea,
759 Saratov reg., Krasnodar Krai) ... *A. decempunctata* (Linnaeus) **
760 2(1). Epimera of mesothorax black. Elytra without transverse fold at apical slope.
761 3(4). Tarsal claw with very small acute denticle at base (Figure 9 C). Elytra yellow, with narrow
762 black sutural stripe, each with 5 black spots. Pronotum pale yellow with M-shaped pattern.
763 Length 3.0–4.5mm. North, middle belt (south to forest-steppe), Crimea ... *A. conglomerata*
764 (Linnaeus) **
765 4(3). Tarsal claw with large rectangular denticle at base (Figure 9 D). Coloration very variable; 2
766 color forms predominate:1) pronotum white with black M-shaped pattern, elytra red or orange,
767 each with 1 black spot, suture not blackened; 2) pronotum black with narrow white lateral stripe,
768 elytra black, each with 3 red spots: on humeral callus, near suture behind mid-length, and near
769 apex (sometimes absent). In the north, color form with rufous elytra bearing 2 black transverse
770 bands inhabits. Length 3.5–5.4mm. Widely distributed ... *A. bipunctata* (Linnaeus) (*frigida*
771 Schneider) **
772

773 27. *Calvia* Mulsant
774 (Weise 1891; Zaslavski 1965)
775 1(6). Elytra rufous with white or light yellow spots. Body always without black pattern on upper
776 and lower sides.
777 2(3). Each elytron with 5 spots. Length 4.9–6.5mm. Middle belt, south ... *C. decemguttata*
778 (Linnaeus) **
779 3(2). Each elytron with 7 spots.
780 4(5). Elytral spots arranged in 4 transverse rows with 1, 3, 2, 1 spots, respectively. Length 4.5–
781 6.0mm. Widely distributed ... *C. quatuordecimguttata* (Linnaeus) (*duodecimmaculata* Gebler) **

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5(4). Elytral spots arranged in 4 transverse rows with 2, 2, 2, 1 spots, respectively. Length 5.0–6.0mm. North, middle belt, south (Krasnodar Krai) ... *C. quindecimguttata* (Fabricius) (*quinquedecimguttata* Fabricius) **

6(1). Dorsal and ventral sides of body with developed black pattern: pronotum rufous with 2 large black spots of irregular shape; elytra yellow with black pattern: sutural stripe, slightly broadened near scutellum and largely angularly broadened at mid-length, 1 spot on humeral callus, 2 spots laterally, or elytra black with very narrow rufous lateral stripe, each with 7 rounded light yellow spots (1, 3, 2, 1); underside rufous with light yellow epimera of meso- and metathorax and with black mesosternum, metasternum, and middle of 1st-3rd abdominal sternites. Length 5.5–5.9mm. Originally described from W. Caucasus, found in N. Caucasus (Kabardino-Balkaria), the Black Sea coast of the Caucasus ... *C. rosti* (Weise) **

Remark. *Calvia rosti* is considered to be an junior synonym of *C.quatuordecimguttata* in new Palaearctic Catalogue (Kovář 2007). However, Iablokoff-Khnzorian (1983) proved a specific rank of *C. rosti*, which differs from *C.quatuordecimguttata*, among other differences, by the stucture of female spermatheca. Korotyaev *et al*. (2012) also consider *C. rosti* as a separate species.

28. *Propylea* Mulsant

(Zaslavski 1965)

1(1). Dorsum yellow. Pronotum with 4 or 6 black spots, which can be fused in large 4-lobed spot. Elytra with black suture, each with 6–7 elongated quadrangular black spots, which usually connected to each other; pattern variable. Length 3.5–4.5mm. Widely distributed ... *P. quatuordecimpunctata* (Linnaeus) **

29. *Sospita* Mulsant

(Zaslavski 1965)

1(1). Dorsum rufous or black. 7 spots on pronotum and 10 spots on each elytron white or pale yellow. Length 4.7–6.0mm. North, middle belt, south (Caucasus) ... *S. vigintiguttata* (Linnaeus) **

30. *Myzia* Mulsant

(Zaslavski 1965)

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814 2(1). Pronotum white (light yellow) with rufous or black M-shaped spot. Elytra rufous with
815 white spots and longitudinal stripes; coloration variable. Length 6.0–9.0mm. Widely distributed
816 ... *M. oblongoguttata* (Linnaeus) (*Neomysia oblongoguttata*) **

817

818 31. *Vibidia* Mulsant

819 (Zaslavski 1965)

820 1(1). Dorsum rufous, pronotum with white lateral sides, each elytron with 6 white spots. Length
821 3.0–4.1mm. Widely distributed ... *V. duodecimguttata* (Poda) **

822

823 32. *Coccinula* Dobrzhanskiy

824 (Zaslavski 1965)

825 1(2). All 4 spots, adjacent to elytral lateral margin, usually separated from each other, rarely two
826 anterior ones connected to each other; posterior spot kidney-shaped. Length 3.0–4.3mm. Widely
827 distributed ... *C. quatuordecimpustulata* (Linnaeus) **
828 2(1). All 4 spots, adjacent to elytral lateral margin, usually connected to each other; posterior
829 spot quadrangular or semicircular (Figure 8 E). Length 2.6–3.5mm. South (Saratov reg., Crimea,
830 Caucasus) ... *C. sinuatomarginata* (Faldermann) **

831

832 33. *Psyllobora* Dejean

833 (Zaslavski 1965)

834 1(1). Dorsum entirely yellow or with head and pronotum white, with black spots: 5 on pronotum,
835 11 on each elytron. Length 3.0–4.5mm. Widely distributed ... *P. vigintiduopunctata* (Linnaeus)
836 **

837

838 34. *Harmonia* Mulsant

839 (Zaslavski 1965; Kuznetsov 1992)

840 1(2). Elytra without transverse fold at apical slope. Pronotum light yellow with 11 black spots,
841 sometimes partially fused to each other. Each elytron with 8 black spots or with only 2 spots at
842 lateral margin. Length 5.0–6.5mm. Widely distributed ... *H. quadripunctata* (Pontoppidan) **
843 1(2). Elytra with transverse fold at apical slope. Pronotum light yellow or white, with black M-
844 shaped pattern, which sometimes spreading at most of pronotal surface, and then only lateral
845 sides remaining light. Elytral coloration variable; two color forms predominate: 1) elytra rufous
846 with common black spot near scutellum, each with 9 black spots, sometimes without of them, 2)

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847 elytra black, each with 2 rufous spots: large anterior and small posterior ones. Length 5.8–
848 7.5mm. Introduced in Russian Caucasus, found in Belgorod reg., Crimea and Moscow ... *H.*
849 *axyridis* (Pallas) (*Leis dimidiata* Fabricius) **

850

851 35. *Tytthaspis* Crotch
852 (Zaslavski 1965)
853 1(2). Dorsum yellow, pronotum with 6 black spots, sometimes partially fused to each other,
854 elytra with black sutural stripe, and each with 8 black spots, from which 3–4 lateral spots usually
855 connected to each other forming undulate stripe. Length 2.5–3.2mm. Widely distributed ... *T.*
856 *sedecimpunctata* (Linnaeus) **
857 2(1). Dorsum yellow, pronotum with 2 black spots laterally, elytra with 3 longitudinal black
858 stripes: common sutural one, and one for each elytron. Length 2.0–3.0mm. Middle belt (Penza
859 reg., Mordovia, Tambov, Voronezh, Samara), south ... *T. gebleri* (Mulsant) (*lineola* Gebler) **

860

861 36. *Oenopia* Mulsant
862 (Zaslavski 1965)
863 1(2). Pronotum white or light yellow, with 7 black spots; elytra pink or yellow with black sutural
864 stripe and each with 7–8 black irregular spots, rarely elytra entirely black. Length 3.5–5.0mm.
865 Widely distributed ... *O. conglobata* (Linnaeus) **
866 2(1). Pronotum black with yellow lateral sides; elytra black, each with 6 yellow spots, from
867 which 3 spots adjacent to lateral margin are separate or connected to each other. Length 3.0–
868 3.7mm. Ukraine (Iablokoff-Khnzorian 1983) ... [*O. lyncea* (Olivier)] *

869

870 37. *Cycloneda* Crotch
871 (Gordon 1985)
872 1(1). Pronotum black with white pattern. Elytra red with narrow white band at base near
873 scutellum and black lateral margin. Length 3.2–6.5mm. Introduced for control of aphids in
874 greenhouses ... *C. sanguinea limbifer* Casey*

875

876 38. *Coccinella* Linnaeus
877 (Zaslavski 1965; Kuznetsov 1992)
878 1(10). Epimera of mesothorax white.

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2(3). Elytra rufous with 3 transverse black bands, from which anterior one is entire, and two others interrupted at suture. Pronotum black with anterior angles white. Length 4.9–5.6mm. North ... *C. trifasciata* Linnaeus **

3(2). Elytra rufous or red with black spots.

4(7). Length not less than 6.0mm. Elytra with common spot near scutellum and each with 3 or 4 spots (in latter case, with spot on humeral callus).

5(6). Lateral margin of elytron broadened in anterior 1/2 (Figure 9 A), narrow in posterior 1/2. Elytra with common spot near scutellum and each with 3 spots of different size. Pronotum black with white anterior angles. Length 6.3–7.9mm. Widely distributed ... *C. septempunctata* Linnaeus **

6(5). Lateral margin of elytron narrow along entire length (Figure 9 B). Elytra with common spot near scutellum and each usually with 3 spots, from which lateral spot in anterior 1/2 small, and two others very large (Figure 8 F), rarely with one more small spot on humeral callus. Pronotum black with white anterior angles. Length 6.0–8.0mm. Widely distributed ... *C. magnifica* Redtenbacher (*distincta* Faldermann) **

7(4). Length no more than 5.2mm. Elytra with common spot near scutellum and each with 2, 4 or 5 spots. If 4 spots present, then spot on humeral callus absent.

8(9). Elytra with common spot near scutellum and each with 4 or 5 spots. Pronotum black with white lateral stripe broadened anteriorly. Length 3.5–4.7mm. Widely distributed ... *C. undecimpunctata* Linnaeus **

9(8). Elytra with common spot near scutellum and each with 2 spots. Pronotum black with white lateral spot broadened anteriorly. Length 4.3–5.2mm. Widely distributed ... *C. quinquepunctata* Linnaeus **

10(1). Epimera of mesothorax black.

11(12). Elytra with common small spot near scutellum and each with 1 large black spot at mid-length. Length 4.5–7.0mm. Widely distributed ... *C. saucerottii lutshniki* Dobrzhanskiy**

12(11). Elytra yellow with black pattern composed of fused elongated spots. Length 3.5–4.5mm. North, middle belt ... *C. hieroglyphica* Linnaeus**

39. *Aiolocaria* Crotch

(Kuznetsov 1992)

1(1). Pronotum black with yellow or orange lateral sides. Elytra black with 4 orange or red spots, forming characteristic pattern: 2 elongated spots along lateral margin (posterior spot sometimes divided in two parts) and 2 spots along suture: anterior one horseshoe shaped (sometimes divided

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in two parts) and posterior one oval or triangular. Length 7.3–12.0mm. Attempts were made to introduce this species in Ukraine, Georgia, and Kazakhstan ... [*A. hexaspilota* (Hope)] *

40. *Myrrha* Mulsant

(Zaslavski 1965)

1(1). Dorsum rufous or light brown, with yellow (white) pronotal lateral sides, 2 spots at pronotal base, and 8–9 spots on each elytron. Length 3.5–4.6mm. Widely distributed ... *M. octodecimguttata* (Linnaeus) **

41. *Halyzia* Mulsant

(Zaslavski 1965)

1(1). Dorsum rufous, with white (light yellow) spots: 3 on pronotum and 8 on each elytron. Pronotum and elytra with widely bent and translucent lateral margin. Length 5.8–6.4mm. North, middle belt, south (Krasnodar Krai) ... *H. sedecimguttata* (Linnaeus) **

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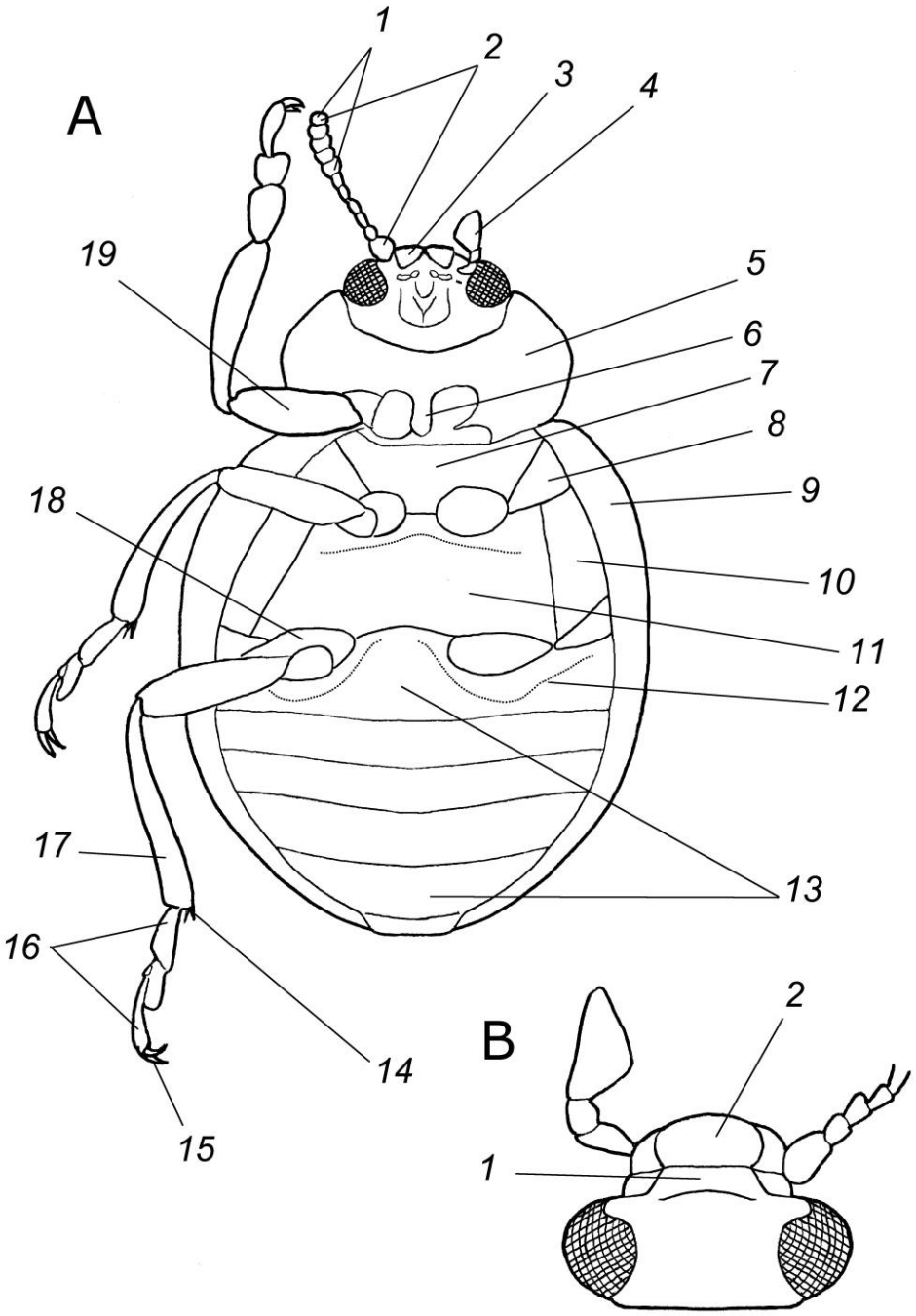

Figure 1. ***Ceratomegilla notata*** **(Laicharting), taxonomical characters. (A)** Total ventral view: **1** – antennal club, **2** – antenna, **3** – mandible, **4** – maxillary palpus, **5** – prothoracic hypomeron, **6** – prosternal process, **7** – mesosternum, **8** – epimera of mesothorax, **9** – elytral epipleura, **10** – episterna of metathorax, **11** – metasternum, **12** – femoral line, **13** – abdominal sternites, **14** – tibial spur, **15** – tarsal claw, **16** – tarsus, **17** – tibia, **18** – coxa, **19** – femur. **(B)** – head, dorsal view: **1** – clypeus, **2** – labrum. (original).

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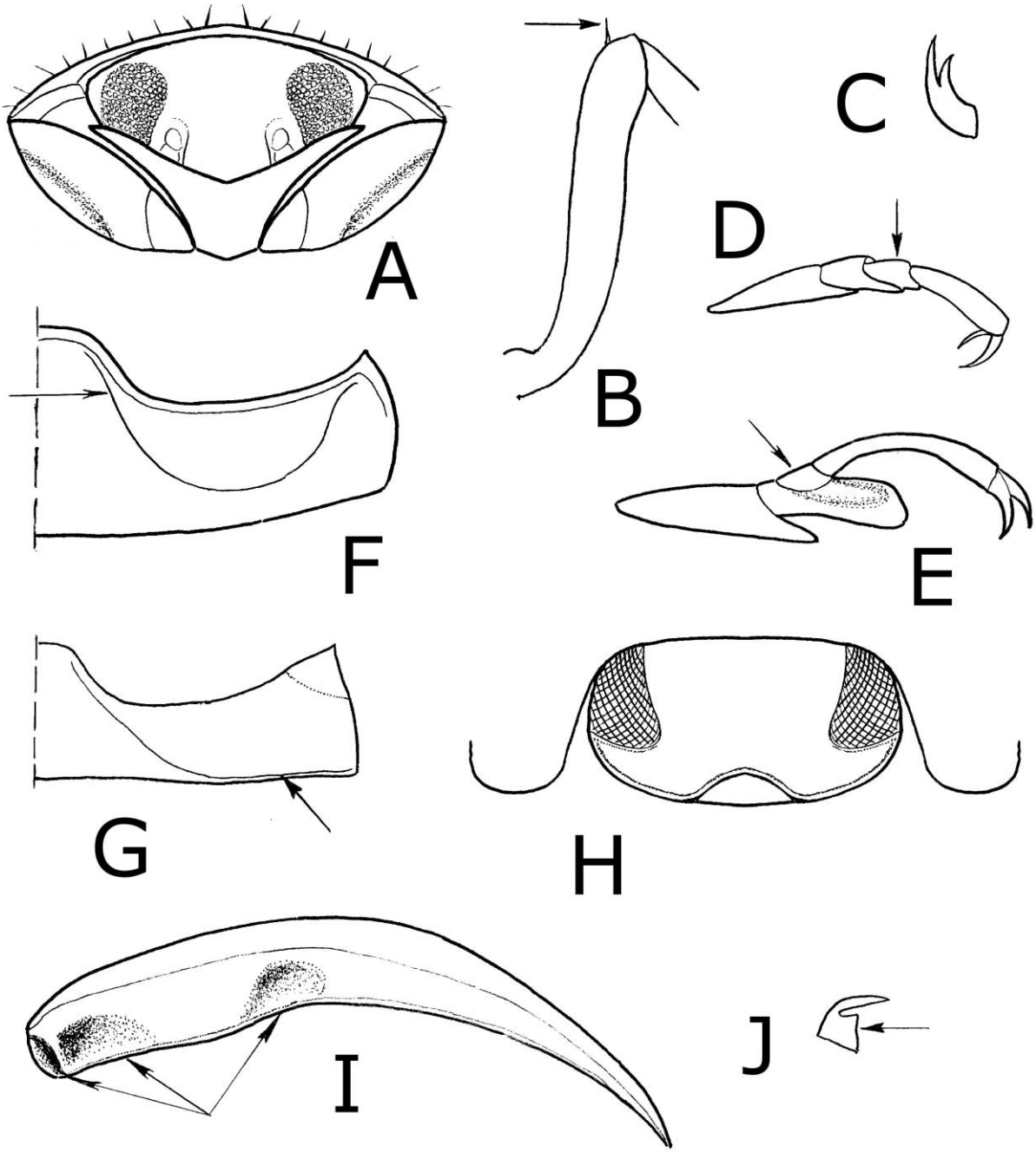

1018

1019 **Figure 2. Details of different species of ladybirds. (A)** *Serangium montazerii* Fürsch, head and
1020 prothorax, ventral view. **(B–C)** *Subcoccinella vigintiquatuorpunctata* (Linnaeus): **(B)** – fore
1021 tibia, arrow shows the spur, **(C)** Tarsal claw. **(D–E)** Hind-tarsus, arrow shows 3rd tarsomere: **(D)**
1022 *Tetrabrachys connatus* (Creutzer), **(E)** *Anatis ocellata* (Linnaeus). **(F–G)** 1st abdominal sternite,
1023 left half, arrow shows femoral line: **(F)** – *Exochomus quadripustulatus*(Linnaeus), **(G)**
1024 *Chilocorus renipustulatus* (Scriba). **(H)** *Ch. renipustulatus*, head, front view, arrow shows
1025 marginate clypeus. **(I–J)** *Cynegetis impunctata* (Linnaeus): **(I)** Elytral epipleura, ventral view,
1026 arrows show impressions, **(J)** Tarsal claw. (original).

1027

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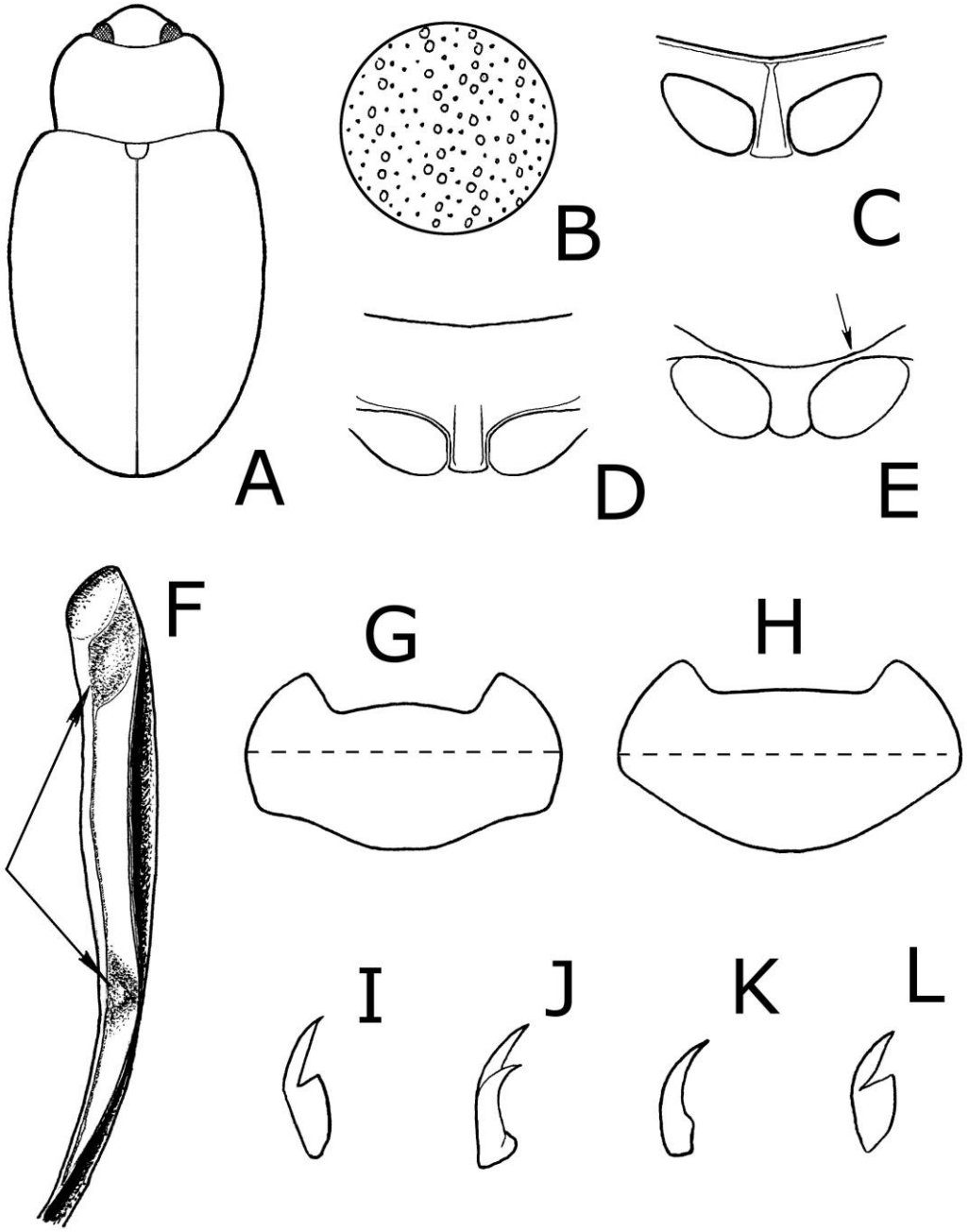

Figure 3. Details of different species of ladybirds. (A–B) *Coccidula rufa* (Herbst): **(A)** Total dorsal view, **(B)** elytral punctuation. **(C–E)** Prosternum, arrow shows the lateral part: **(C)** *Scymnus inderihensis* Mulsant, **(D)** – *Cryptolaemus montrouzieri* Mulsant, **(E)** – *Clitostethus arcuatus* (Rossi). **(F)** *Hyperaspis reppensis* (Herbst), elytral epipleura, arrows show impressions. **(G–H)** Pronotum: **(G)** *Anisosticta novemdecimpunctata* (Linnaeus), **(H)** *Bulaea lichatschovi* (Hummel). **(I–L)** Tarsal claw: **(I)** *Ceratomegilla notata* (Laicharting), **(J)** *Hippodamia variegata* (Goeze), **(K)** *Bulaea lichatschovi*, **(L)** *Anatis ocellata* (Linnaeus). (original).

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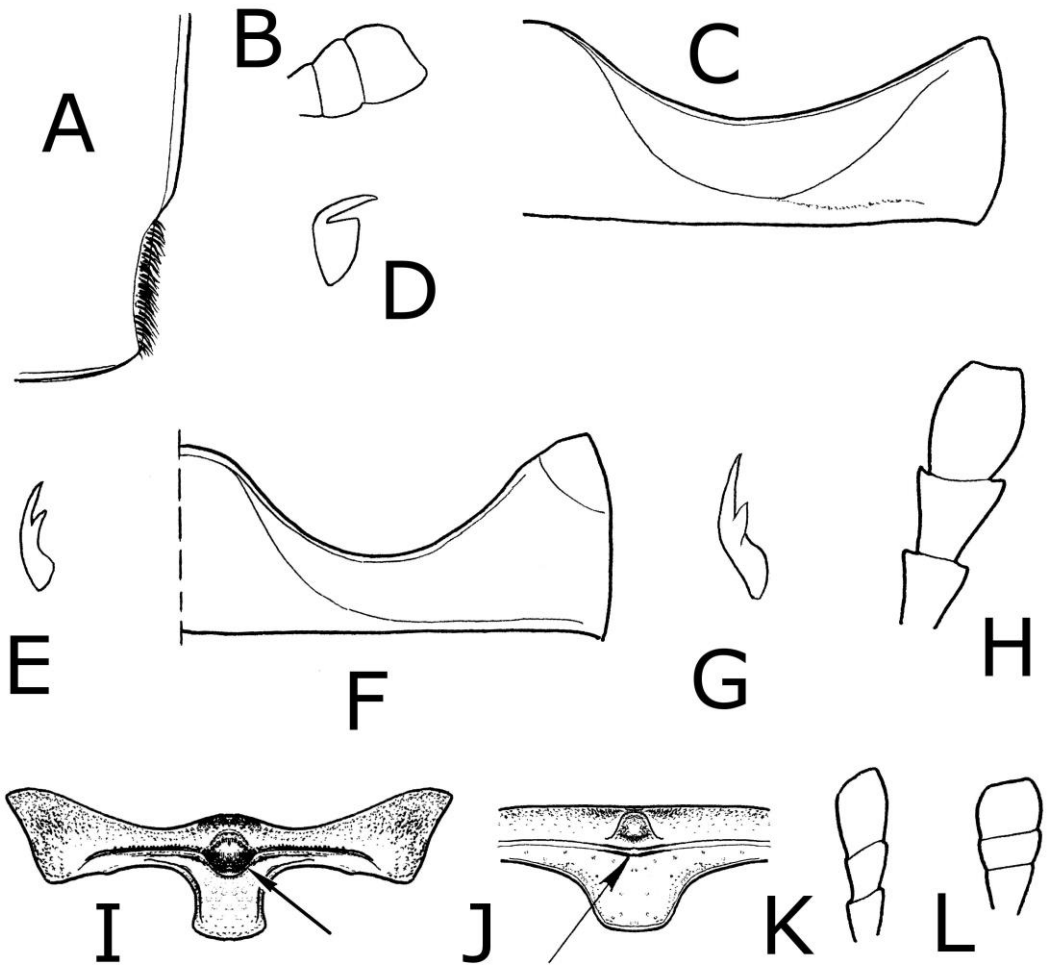

Figure 4. Details of different species of ladybirds. (A) *Anatis ocellata* (Linnaeus), apex of elytral suture. **(B–D)** *Adalia bipunctata* (Linnaeus): **(B)** Apex of antenna, **(C)** 1st abdominal sternite, left half, **(D)** Tarsal claw. **(E)** *Hippodamia arctica* (Schneider), tarsal claw. **(F)** *Calvia decemguttata* (Linnaeus), 1st abdominal sternite, left half. **(G–H)** *Myzia oblongoguttata* (Linnaeus): **(G)** Tarsal claw, **(H)** Apex of antenna. **(I–J)** Mesosternum, ventral view, arrow shows anterior border: **(I)** *C. decemguttata*, **(J)** *Harmonia quadripunctata* (Pontoppidan). **(K–L)** Apex of antenna: **(K)** *Vibidia duodecimguttata* (Poda), **(L)** *Coccinula quatuordecimpustulata* (Linnaeus). (original).

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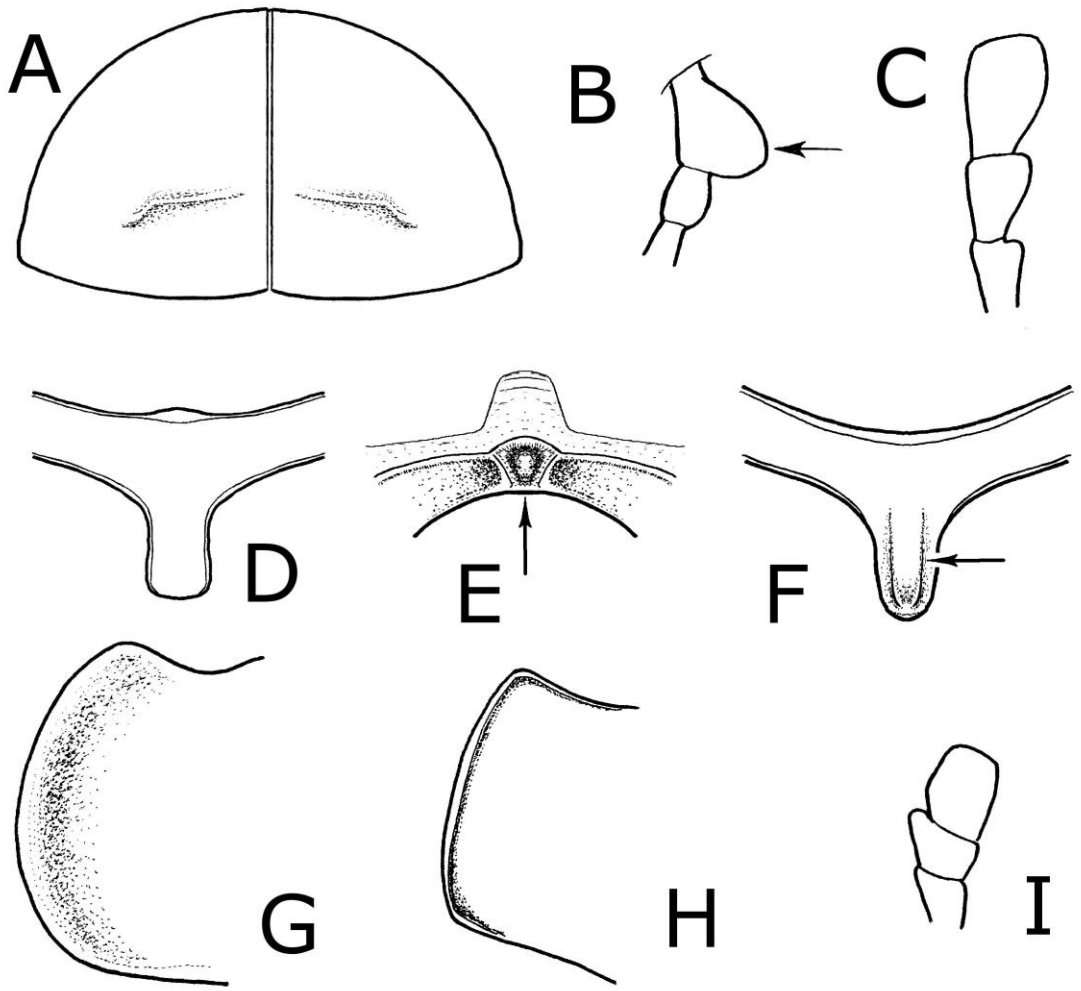

Figure 5. Details of different species of ladybirds. (A) *Harmonia axyridis* (Pallas), elytral apical slope from behind. **(B)** *Aiolocaria hexaspilota* (Hope), base of antenna, arrow shows lobe of the 1st antennomere. **(C–D)** *Halyzia sedecimguttata* (Linnaeus): **(C)** Apex of antenna, **(D)** Process of prosternum. **(E)** *H. axyridis*, mesosternum, front view, arrow shows impression. **(F)** *Myrrha octodecimguttata* (Linnaeus), process of prosternum, arrow shows lateral furrow. **(G–H)** Pronotum, left side: **(G)** *Cycloneda sanguinea limbifer* Casey, **(H)** *Coccinella septempunctata* Linnaeus. **(I)** *Calvia quatuordecimguttata* (Linnaeus), apex of antenna. (original).

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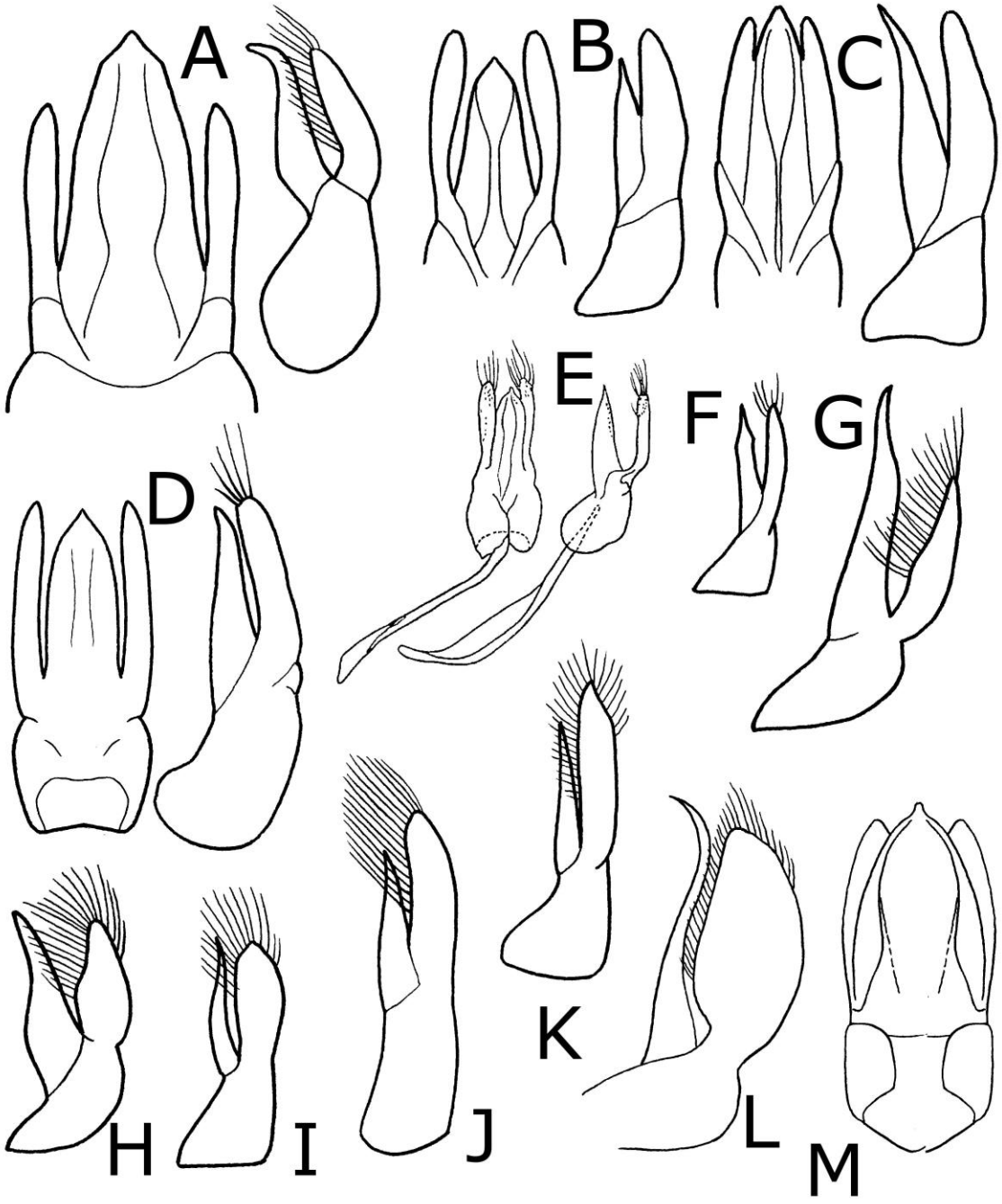

Figure 6. Aedeagus of different species of ladybirds. (A) *Scymnus mimulus* Capra et Fuersch. **(B)** *S. apetzi* Mulsant. **(C)** *S. pallipediformis* Guenther. **(D)** *S. marinus* (Mulsant). **(E)** *Nephus reunioni* (Fuersch). **(F)** *S. interruptus* (Goeze). **(G)** *S. doriae* Capra. **(H)** *S. frontalis* (Fabricius). **(I)** *S. ferrugatus* (Moll). **(J)** *S. limbatus* Stephens. **(K)** *S. haemorrhoidalis* Herbst. **(L)** *S. jakowlewi* Weise. **(M)** *S. inderihensis* Mulsant. **(A–E)** Dorsal and lateral view, **(F–L)** Lateral view, **(M)** Dorsal view. (**A–D, F–K** – after Lompe (2002), **E** – after Chazeau, *et al*. (1974), others – original).

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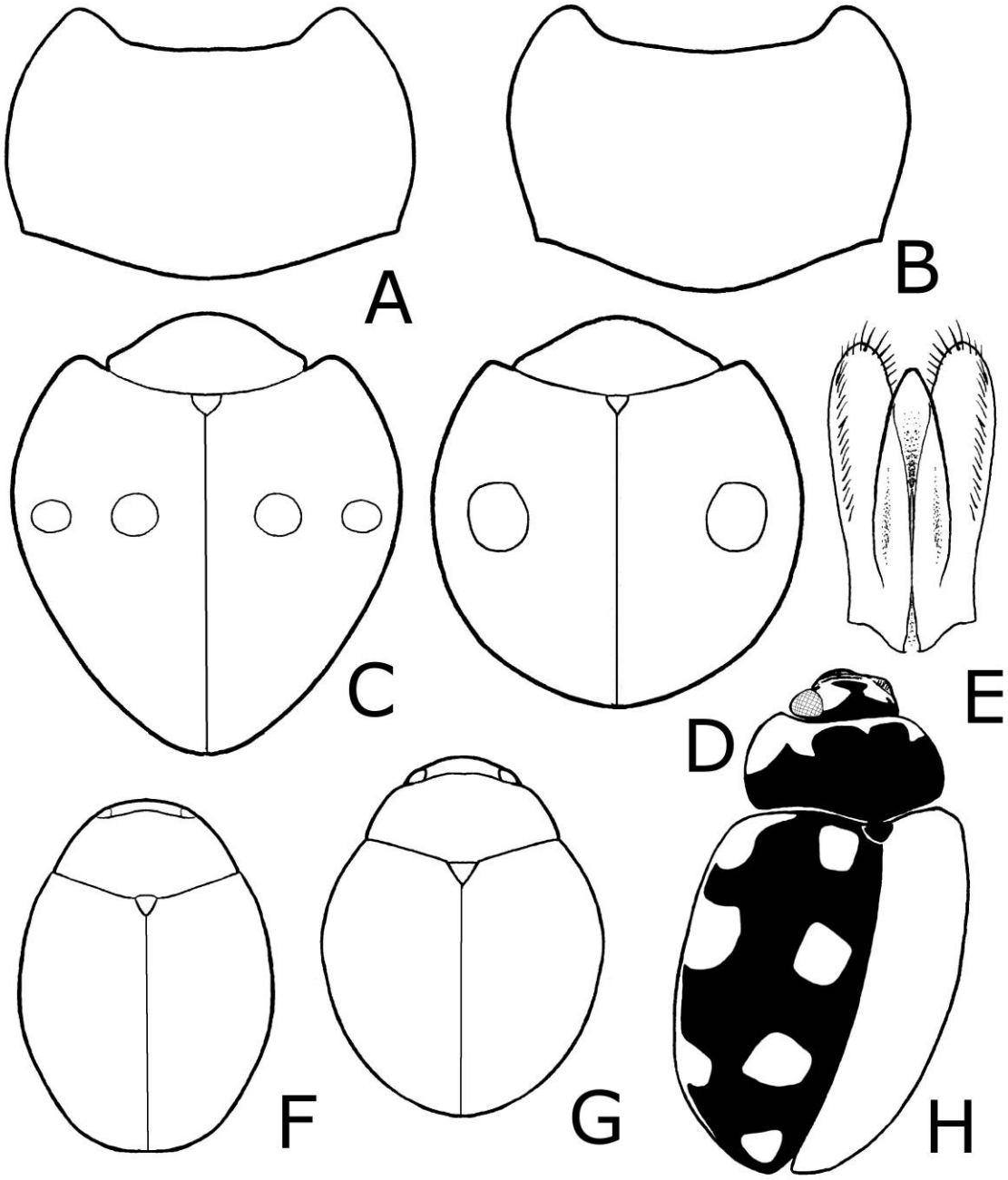

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1066 **Figure 7. Details of different species of ladybirds. (A–B)** Contour of pronotum: **(A)**
1067 *Tetrabrachys connatus* (Creutzer), **(B)** *T. weisei* (Reitter). **(C–D)** Shape of body and elytral
1068 pattern: **(C)** *Chilocorus infernalis* Mulsant, **(D)** *Ch. renipustulatus* (Scriba) (= *kuwanae*,
1069 specimen from Japan, Honshu Isl.). **(E)** Male aedeagus *Ch. renipustulatus* (= *kuwanae*, specimen
1070 from Japan, Honshu Isl.). **(F–G)** Shape of body: **(F)** *Hyperaspis reppensis* (Herbst), **(G)** *H.*
1071 *inexpectata* Guenther. **(H)** – *Ceratomegilla schneideri* (Weise), total view. (original).

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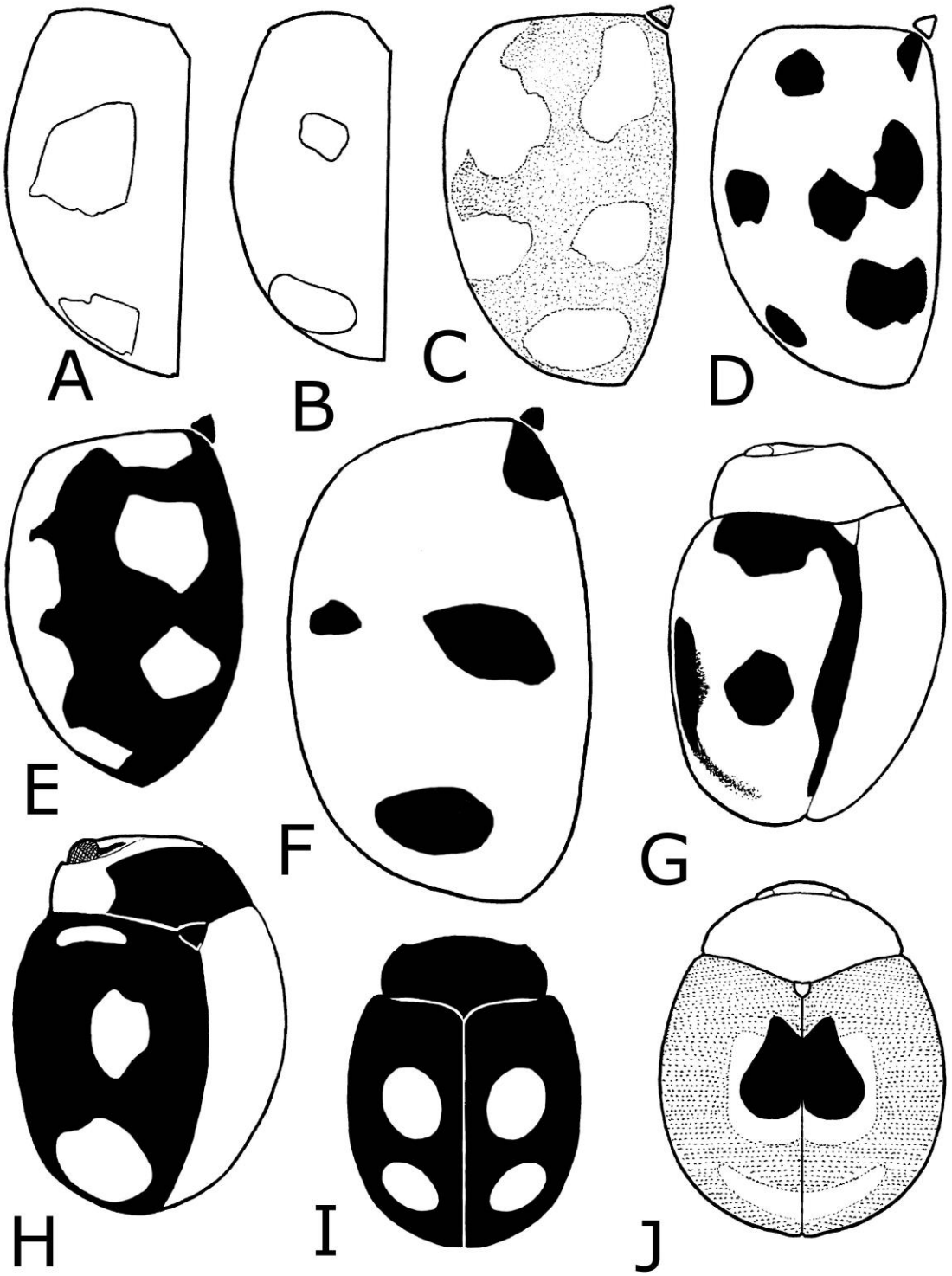

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1074 **Figure 8. Details of different species of ladybirds. (A–F)** – Left elytron: **(A)** – *Hyperaspis*
1075 *desertorum* Weise, **(B)** – *H. femorata* Motschulsky, **(C–D)** *Adalia decempunctata* (Linnaeus),
1076 **(E)** *Coccinula sinuatomarginata* (Faldermann), **(F)** *Coccinella magnifica* Redtenbacher. **(G–J)**
1077 Total view: **(G)** – *Scymnus argutus* Mulsant, **(H)** *Hyperaspis effusa* Weise, **(I)** – *Nephus reunioni*
1078 (Fuersch), **(J)** *Clitostethus arcuatus*(Rossi). (H – after Chazeau, *et al*. (1974), others – original).

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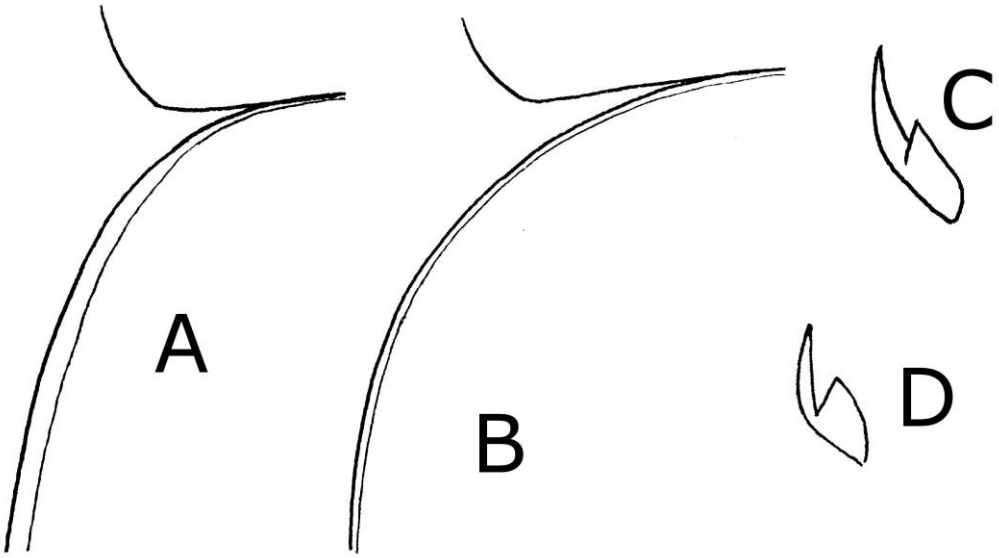

Figure 9. Details of different species of ladybirds. (A–B) Lateral border of left elytron near base, dorsal view: **(A)** *Coccinella septempunctata* Linnaeus, **(B)** *C. magnifica* Redtenbacher. **(C–D)** Tarsal claw: **(C)** *Adalia conglomerata* (Linnaeus), (D) *A. bipunctata* (Linnaeus). (original).

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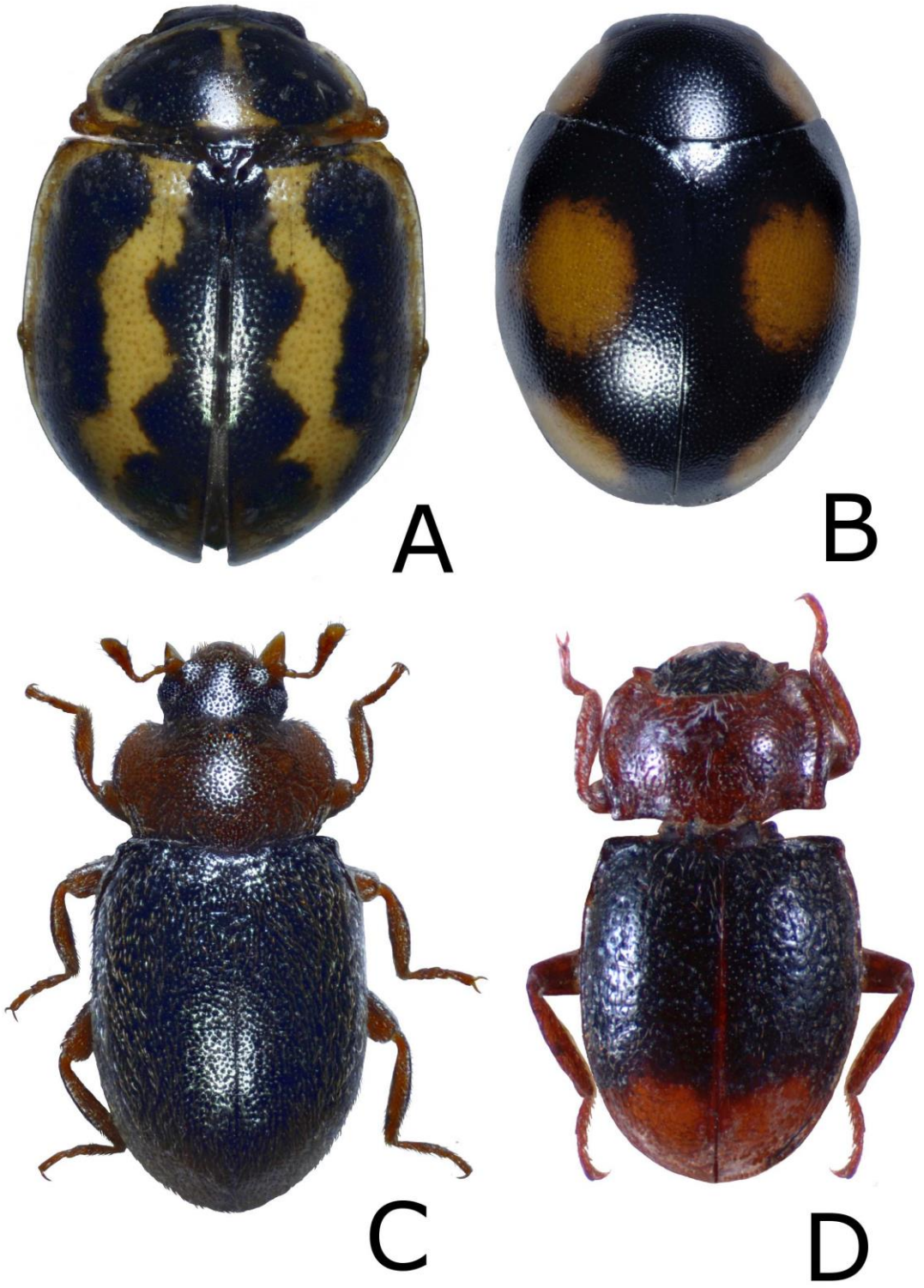

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1086 **Figure 10. Different species of ladybirds. (A)** *Anisosticta strigata* (Thunberg) (NE European
1087 Russia: Komi Republic, Ust-Tsylma Vill.), **(B)** *Hyperaspis desertorum* Weise (SE Eurpoean
1088 Russia: Astrakhan reg.), **(C)** *Tetrabrachys weisei* (Reitter) (Crimea Penins.), **(D)** *T. arnoldii*
1089 (Iablokoff-Khnzorian), holotype (Russian Caucasus: Goryachy Kliuch). (A-C – original, D –
1090 photo by A.G. Moseyko).

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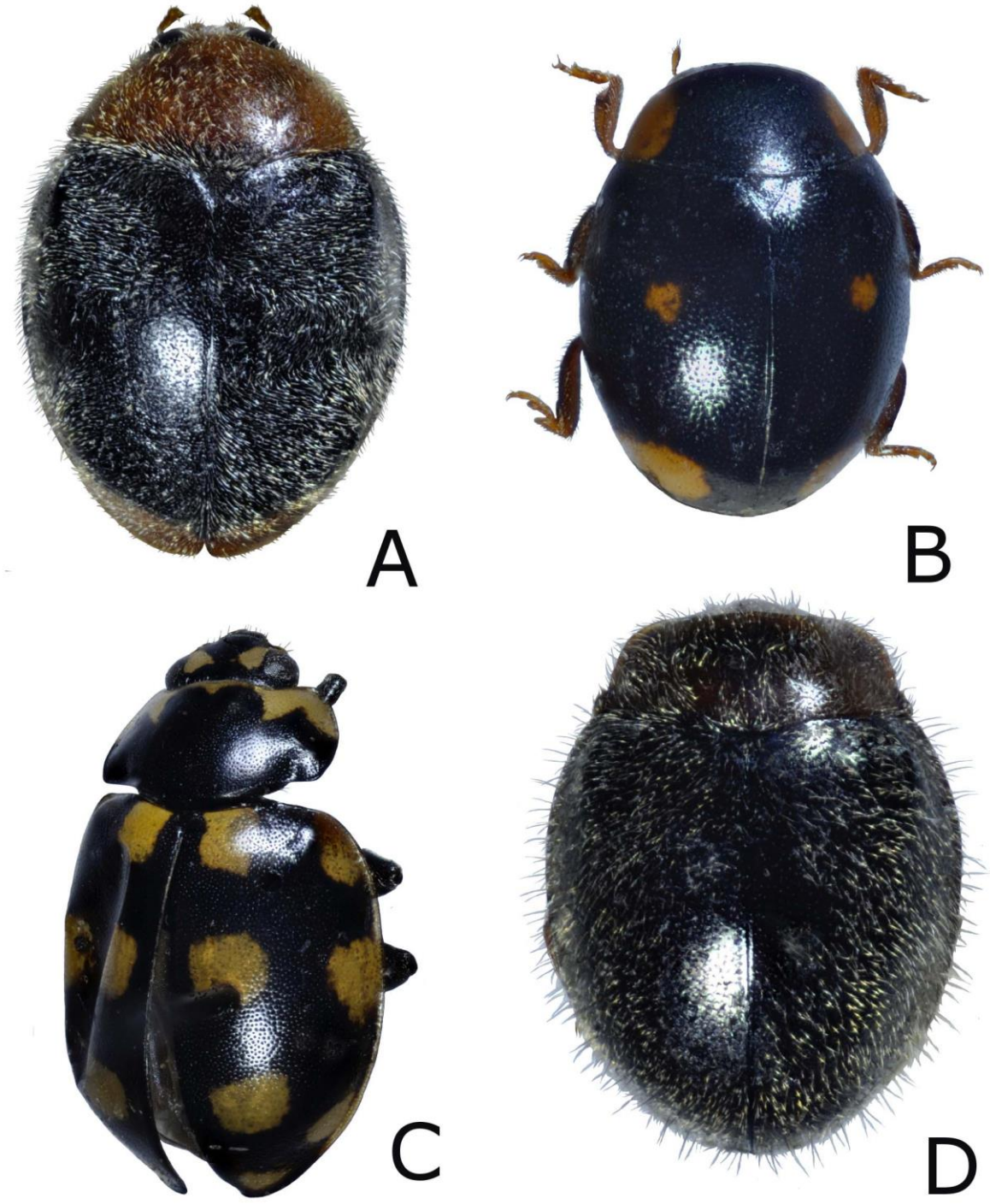

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1093 **Figure 11. Different species of ladybirds. (A)** *Cryptolaemus montrouzieri* Mulsant (Russian
1094 Caucasus: Sochi), **(B)** *Hyperaspis femorata* Motschulsky (Russian Caucasus: Gelendzhik), **(C)** .
1095 *Ceratomegilla schneideri* (Weise) (Russain Caucasus, Adygea Republic), **(D)** *Lindorus*
1096 *lophanthae* (Blaisdell) (Russian Caucasus: Sochi). (original).