

A Review of Aphodiines of the Subgenus *Chilothorax* Motschulsky, Genus *Aphodius* Illiger (Coleoptera, Scarabaeidae), from Russia and Neighboring Countries

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Abstract—Representatives of the genus *Aphodius* Ill., subgenus *Chilothorax* Motsch., of Russia and adjacent countries are reviewed. A key to the species and notes on their synonymy and distribution are given. Two little known species (*A. variicolor* D. Kosh. and *A. balachanicola* Balth.) are redescribed and a new species, *A. xanthellus* sp. n., is described. Three new synonymies (*A. clausula* W. Kosh., 1910 = *A. gussakovskii* Sem. et Medv., 1929, **syn. n.**; *A. grafi* Reitter, 1902 = *A. kryzhanovskii* Nikritin, 1969, **syn. n.**; = *A. schutovae* Nikritin, 1969, **syn. n.**) are established.

The subgenus *Chilothorax* Motsch. is one of the largest subgenera within the genus *Aphodius* Ill. and, at the same time, one of the most difficult diagnostically because of the wide variability of diagnostic characters and great number of species. In many cases, one cannot identify reliably the representatives of the subgenus, especially Asian species, with the use of the available keys. Some species are rare or known only from type specimens, and many characters necessary for reliable identification are missing from the original descriptions. Some species were placed in the subgenus *Chilothorax* on the basis of few formal characters, without taking into account the structure of the aedeagus and other important characters. At the same time, a few species placed by some authors in the subgenera *Mendidius* Har., *Nobius* Muls., *Pseudacrossus* Reitt., and *Aphodaulacus* W. Kosh. are closely related to representatives of *Chilothorax*.

This made necessary a revision of this subgenus and compilation of a new key. In this communication, two poorly known species from Middle Asia and Kazakhstan (*A. variicolor* D. Kosh. and *A. balachanicola* Balth.) are re-described and a new species closely related to them is described. Lectotypes of a few little known species are designated for the purpose of stabilization of the use of their names. The present paper continues the series of publications on species of the subgenus *Chilothorax* of northern Palaearctic Region (Frolov, 2001).

Most of the material examined is deposited in the collection of the Zoological Institute, Russian Acad-

emy of Sciences, St. Petersburg (ZIN). Specimens from the collection of the National Museum of Natural History (NMPC, Prague), and Radek Červenka's collection (RCCP, Prague) were also used.

GENUS *APHODIUS* ILLIGER

Subgenus *Chilothorax* Motschulsky

The subgenus *Chilothorax* is a rather heterogeneous group. There is no character unique to this taxon. As treated here, the subgenus may be characterized in the following way.

Description. Elytra straw-yellow or yellowish brown (occasionally with reddish tint), with dark maculae in most species. Elytral pattern varying considerably: in some species individuals with almost immaculate and almost entirely dark elytra occurring, as also all intermediate kinds of coloration. Elytral sides and apices slightly pubescent or nearly glabrous, except in species of the *variicolor* group and *A. hahni* Reitt., in which, however, elytral pubescence still less developed than that in representatives of the subgenera *Melinopterus* Muls. and *Aphodaulacus* W. Kosh. Scutellum triangular. Pronotum with base and sides bordered and hind angles obtuse. Dorsal surface of head (except in *A. ivanovi* Leb.) and pronotum without setae. Clypeus more or less sinuate in the middle and rounded at sides. Apical setae of middle and hind tibiae relatively short, all of equal length, except for several outermost ones.

Based on morphological characters of adults, most of the species under consideration can be placed in 6

species-groups. Within the groups, the shape of aedeagus is about the same, but the shape and size of the weakly sclerotized processes of parameres may vary.

1. *conspurcatus* group. *A. conspurcatus* (L.) (type species of the subgenus *Chilo thorax*), *A. paykulli* Bed., *A. pictus* Sturm. Species of this group have truncate lower spur of middle tibia in male, clypeus sinuate at sides, black or brown-black disc of head and pronotum, frontal tubercles (more developed in male), and glabrous disc of metasternum. To this group probably belongs also *A. plustschewskii*, which, however, differs in having a brush of dense setae on hind tibia in male and in the shape of aedeagus.

2. *melanostictus* group. *A. melanostictus* W. Schmidt, *A. clathratus* Reitt., *A. auliensis* Balth., *A. distinctus* (Müller, 1776), *A. planus* D. Kosh., *A. flammulatus* Har. Species of this group have brown-black disc of head and pronotum, frontal tubercles in male, and rugose clypeus in female. *A. ivanovi* Leb. can also be placed in this group based on the shape of the parameres and elytral pattern.

3. *nigrivittis* group. *A. nigrivittis* Sols., *A. praenubilis* Balth., *A. kerzhneri* Nikolajev, *A. exilimanus* Kabakov, and *A. altaicus* Nikolajev (occurring in Mongolia and China). Species of this group are characterized by black or brown-black disc of head and pronotum, nontuberculate head, glabrous disc of metasternum, and almost glabrous elytra. Three species (*A. praenubilis*, *A. kerzhneri*, and *A. exilimanus*) have a characteristic shape of fore tibia in ♂, but the shape of the aedeagus, almost identical to that of *A. nigrivittis*, points close affinity of these species.

4. *grafi* group. *A. grafi* Reitt., *A. pamirensis* Medv., *A. jacobsoni* W. Kosh., *A. tanhensis* Frolov. Species of this group are characterized by brown to pale brown head and pronotum, nontuberculate head, pubescent disc of metasternum in both sexes (except for *A. jacobsoni*). *A. alexis* Frolov, described from Mongolia, also belongs in this group.

5. *comma* group. *A. comma* Reitt., *A. clausula* W. Kosh., *A. zaissanicus* Nikolajev. Species of this group are characterized by nontuberculate head, similar elytral pattern and appearance, and size smaller than in species of other groups. This group is more heterogeneous than the preceding ones and probably is not monophyletic.

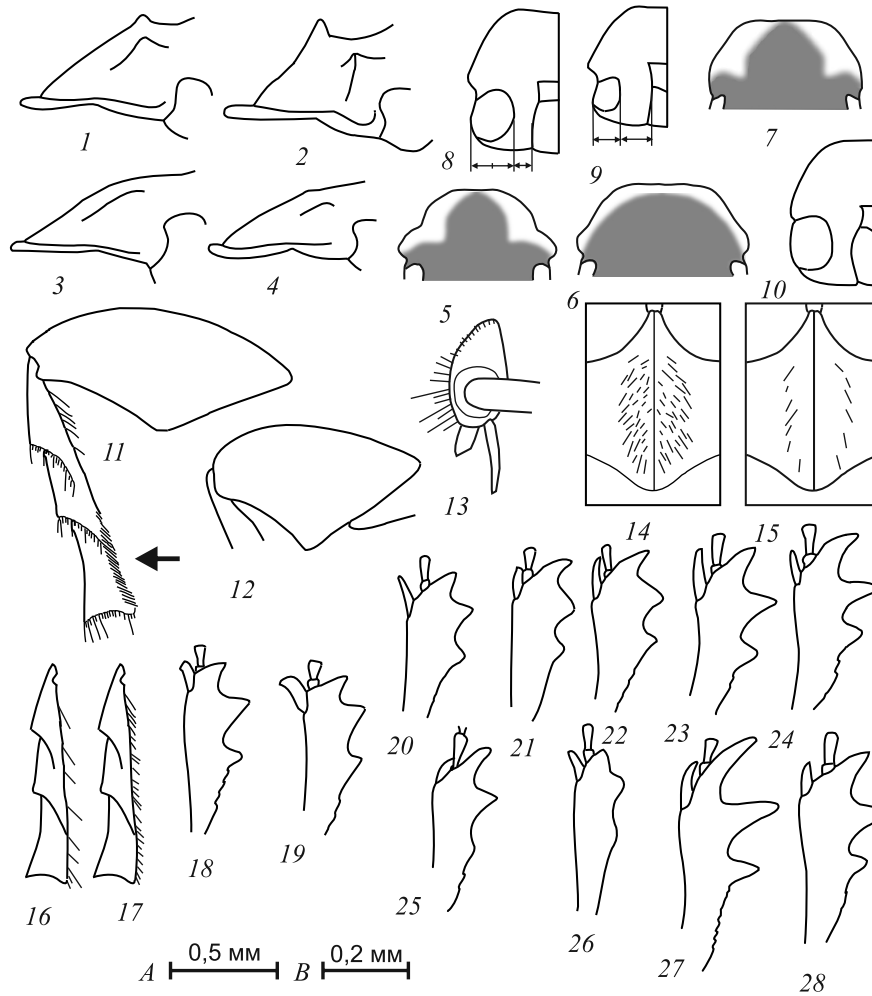
6. *variicolor* group. *A. variicolor* D. Kosh., *A. xanthellus* sp. n., *A. balachanicola* Balthasar, and

widely distributed in the Mediterranean *A. hieroglyphicus* Klug. Species of this group are characterized by brown or pale brown head and pronotum, pubescent lateral and apical parts of elytra (pubescence is more developed in male), nontuberculate head, and relatively large eyes. Disc of metasternum pubescent in male and glabrous in female.

Other species dealt with in this review [*A. badenkoi* Nikolajev, *A. figuratus* A. Schm., *A. flavimargo* Reitt., *A. sticticus* (Panz.), *A. hahni* Reitt., *A. mongolaltaicus* Nikolajev] cannot be placed in any of the above-mentioned groups or in other subgenera.

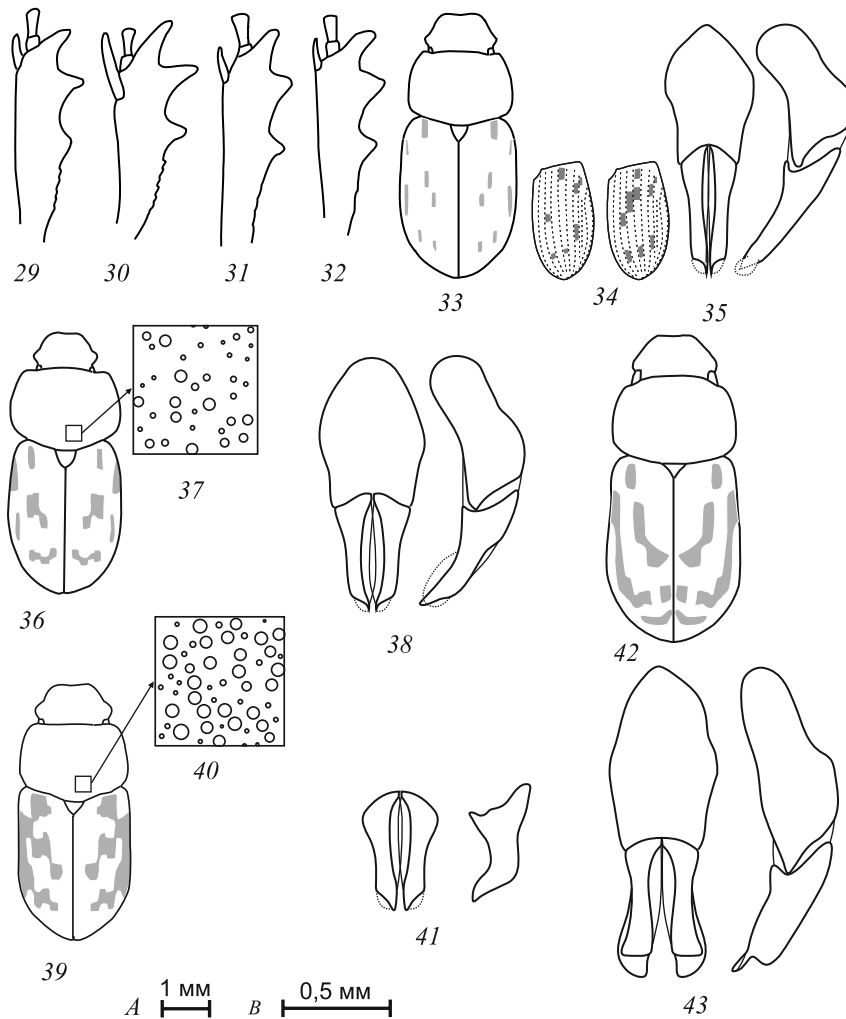
Key to the *Chilo thorax* Species from Russia and Neighboring Countries

1. Clypeus very coarsely granulate, with short yellowish setae. Elytra straw-yellow with small brown maculae (Fig. 47). Aedeagus as in Fig. 48. Body length 3–4 mm. Caspian Lowland 11. *A. ivanovi* Leb.
- Clypeus glabrous, not granulate, or with small granules only 2.
2. Frons more or less tuberculate (Fig. 1, 2) or with traces of tubercles (Fig. 4), densely punctate, or anteriorly rugose in ♀. Anterior margin of clypeus occasionally finely granulate (European species). Head and pronotum black or brown. Fore tibial spur in ♂ occasionally elongated and downward curved (Figs. 18, 19). Inner margin of fore tibia in ♂ slightly concave, tibia never narrow and parallel-sided. Species from Europe and Asia 3.
- Frons nontuberculate (Fig. 3), more or less distinctly punctate (punctures denser in ♀) but not rugose (head finely granulate in both sexes in species from Middle Asia and Caspian Region). Head and pronotum black, dark brown, or pale brown. Fore tibial spur in ♂ never elongated and curved downwards. Fore tibia in ♂ occasionally narrow and parallel-sided with straight or slightly convex inner margin (Figs. 26, 29, 31, 32). Species from Asia (except for Euro-Caucasian *A. sticticus*) .. 13.
3. Clypeus reddish and sinuate at sides (Fig. 5). Disc of head and pronotum black. Elytral pattern formed by several small spots, weakly varying (Figs. 33, 34). Aedeagus as in Fig. 35. Body length 4.0–5.5 mm 1. *A. conspurcatus* (L.).
- Head entirely brownish black or with paler anterior and lateral margins of clypeus (Fig. 6), or head and



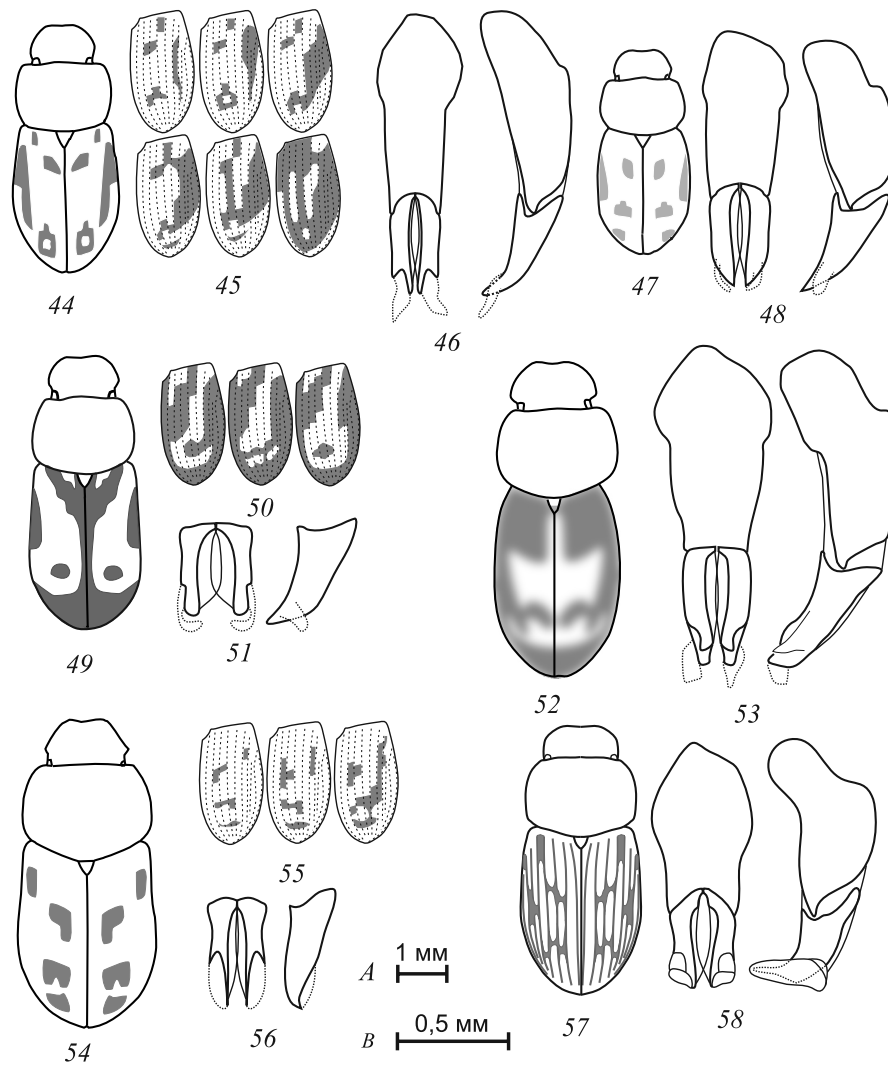
Figs. 1–28. *Aphodius* Ill. (1–4) Head, lateral view; (5–7) head, dorsal view; (8–10) head, ventral view; (11) hind femur and tibia; (12) hind femur; (13) apex of hind tibia; (14, 15) disc of metasternum; (16, 17) hind tibia of female; (18–28) fore tibia. (1) *A. auliensis* Balzh.; (2, 11, 13, 17) *A. plustschewskii* D. Kosh.; (3) *A. nigrivittis* Sols.; (4, 21, 22) *A. planus* D. Kosh. [(21) ♂, (22) ♀]; (5) *A. conspurcatus* (L.); (6) *A. melanostictus* W. Schm.; (7) *A. sticticus* (Panz.); (8, 28) *A. xanthellus* sp. n.; (9) *A. jacobsoni* W. Kosh.; (10, 26) *A. mongolaltaiicus* Nikolajev, ♂; (12) *A. paykulli* Bed.; (14, 16) *A. distinctus* (Müll.); (15, 23) *A. clathratus* Reitt.; (18) *A. hahni* Reitt., ♂; (19, 20) *A. flammulatus* Har. [(19) ♂; (20) ♀]; (24) *A. comma* Reitt., ♂; (25) *A. zaissanicus* Nikolajev, ♂; (27) *A. variicolor* D. Kosh., ♂. (A) scale for Figs. 1–4, 11, 12, 16–28; (B) Fig. 13.

- pronotum entirely brown. Elytral pattern not as above, or elytra entirely brown or fuscous-black 4.
4. Elytra chestnut-brown with reddish tint and pattern of dark maculae (Figs. 66, 67). Fore tibial spur in ♂ elongated and curved downward (Fig. 18). Aedeagus as in Fig. 65. Body length 3.5–4.8 mm. Russia (Southern Urals), northern Kazakhstan 30. *A. hahni* Reitt.
- Elytra straw-yellow or yellowish brown, without reddish tint. Elytral pattern usually more contrasting, often formed by small dark maculae; occasionally dark coloration predominating or elytra entirely blackish brown. Fore tibial spur in ♂ not curved downward. If elytra with reddish tint or fore tibial spur in ♂ strongly curved downwards, then shape of aedeagus not as above and the species occurs in the Transcaucasia 5.
5. Hind tibiae with brush of short dense setae dorsally in ♂ (Fig. 11) and with row of short dense setae in ♀ (Fig. 17). Lower spur of middle tibia in ♂ shorter than 1/2 of upper spur, truncate apically (Fig. 13). Posterior margin of hind femur in ♂ with obtuse-angular prominence. Aedeagus as in Fig. 43. Body length 6.5–7.5 mm. Southern Euro-



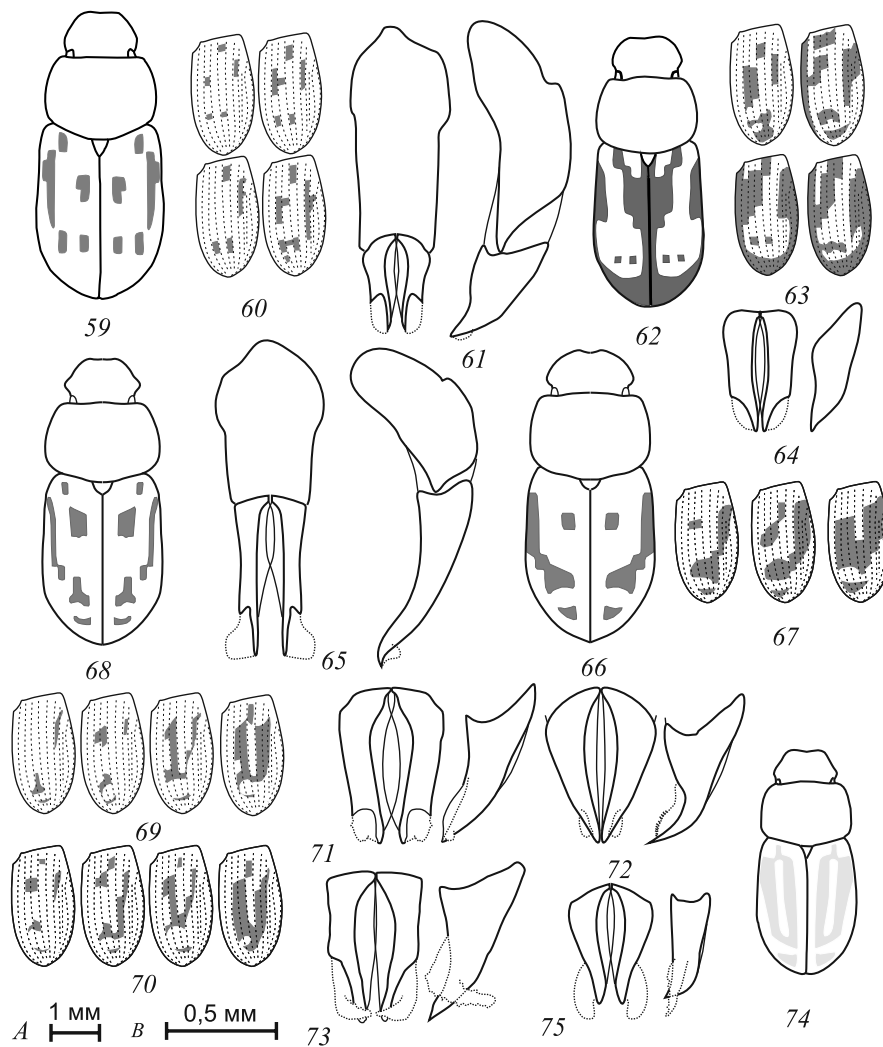
Figs. 29–43. *Aphodius* Ill. (29–32) Fore ♂ tibia ; (33, 36, 39, 42) male habitus; (34) elytral pattern; (35, 38, 43) aedeagus, dorsal and lateral view; (41) parameres, dorsal and lateral view; (37, 40) punctation of pronotal disc in ♀ [square side 0.33 mm]. (29) *A. praenubilis* Balth.; (30) *A. nigrivittis* Sols.; (31) *A. kerzhneri* Nikolajev; (32) *A. exilimanus* Kabakov; (33–35) *A. conspurcatus* (L.); (36–38) *A. pictus* Sturm; (39–41) *A. paykulli* Bed.; (42, 43) *A. plustschewskii* D. Kosh. (A) scale for Figs. 33, 36, 39, 42; (B) Figs. 29–32, 35, 38, 41, 43.

- pean Russia (Volga area), Kazakhstan
 4. *A. plustschewskii* D. Kosh.
- Hind tibia without brush of setae dorsally in ♂, with a row of long sparse setae in ♀ (Fig. 16). Lower spur of middle tibia in ♂ longer than 1/2 of upper spur; if spur shortened then species from Europe or Caucasus 6.
6. Clypeus distinctly sinuate at sides. Lower spur of middle tibia in ♂ shorter than 1/2 of upper spur 7.
- Clypeus not, or very shallowly sinuate at sides (Figs. 6, 7). Lower spur of middle tibia in ♂ longer than 1/2 of upper spur 8.
7. Posterior margin of hind femur in ♂ with obtuse-angular prominence (Fig. 12). Pronotum in ♀ more densely punctate (Fig. 40). Parameres as in Fig. 41. Body length 4.0–5.2 mm
 2. *A. paykulli* Bed.
- Posterior margin of hind femur in ♂ rounded. Pronotum in ♀ more sparsely punctate (Fig. 37). Aedeagus as in Fig. 38. Body length 4.0–5.0 mm
 3. *A. pictus* Sturm.
8. Body wider (Figs. 44, 54, 59). Elytra straw-yellow or pale brown. Elytral pattern formed by small separate maculae, occasionally maculae fused and dark color prevailing; rarely elytra immaculate. Disc of metasternum with dense setae in ♂ or glabrous in both sexes 9.
- Body narrower (Figs. 49, 52, 62). Elytra pale brown to brown with characteristic pattern, or dark chest-



Figs. 44–58. *Aphodius* Ill. (44, 47, 49, 52, 54, 57) Male habitus; (45, 50, 55) elytral pattern; (46, 48, 53, 58) aedeagus, dorsal and lateral view; (51, 56) parameres, dorsal and lateral view. (44–46) *A. distinctus* (Müll.); (47, 48) *A. ivanovi* Leb.; (49–51) *A. planus* D. Kosh.; (52, 53) *A. flammulatus* Har.; (54–56) *A. auliensis* Balzh.; (57, 58) *A. sticticus* (Panz.). (A) scale for Figs. 44, 47, 49, 52, 54, 57; (B) Figs. 46, 48, 51, 53, 56, 58.

- nut-brown with indistinct lighter maculae, or entirely dark brown. Disc of metasternum usually with sparse setae in both sexes (Fig. 15) 11.
- 9. Disc of metasternum with dense setae in ♂ (Fig. 14), coarsely punctate in ♀. Parameres with long processes (Fig. 46). Sides of pronotum dark. Elytral pattern widely varying, occasionally dark color prevailing. Body length 2.9–5.3 mm 8. *A. distinctus* (Müll.).
- Disc of metasternum glabrous in both sexes, finely punctate to nearly smooth in ♀. Parameres without long processes. Sides of pronotum with pale margin. Elytral pattern usually formed by separate small maculae, rarely elytra almost uniformly colored 10.
- 10. Apices of parameres curved upwards (Fig. 56). Base of elytral interval 5 pale or with indistinct dark macula (Fig. 55). Body length 3.7–6.0 mm 7. *A. auliensis* Balzh.
- Apices of parameres not curved upwards (Fig. 61). Base of elytral interval 5 usually with distinct dark macula (Fig. 60). Body length 4.1–6.3 mm 5. *A. melanostictus* W. Schm.
- 11. Spur of ♂ fore tibia long, hooked at apex (Fig. 19); that in ♀ relatively short, slender and incurved (Fig. 20). Elytra brown or chestnut-brown with indistinct pattern of dark brown maculae (Fig. 52), or uniformly chestnut-brown or dark brown. Aedeagus as in Fig. 53. Body length 3.5–5.3 mm 10. *A. flammulatus* Har.



Figs. 59–75. *Aphodius* Ill. (59, 62, 66, 68, 74) Male habitus; (60, 63, 67, 69, 70) elytral pattern; (61, 65) aedeagus, dorsal and lateral view; (64, 71–73, 75) parameres, dorsal and lateral view. (59–61) *A. melanostictus* W. Schm.; (62–64) *A. clathratus* Reitt.; (65–67) *A. hahni* Reitt.; (68, 69, 71) *A. grafi* Reitt.; (70, 72) *A. tanhensis* Frolov; (73) *A. jacobsoni* W. Kosh.; (74, 75) *A. pamirensis* Medv. (A) scale for Figs. 59, 62, 66, 68, 74; (B) Figs. 61, 64, 65, 71–73, 75.

—Spur of fore tibia in ♂ shorter in dorsal view and not hooked at apex (Figs. 21, 23), that in ♀ out-curved (Fig. 22). Elytra pale brown to brown, elytral pattern usually more contrasting 12.

12. Elytral pattern usually slightly varying and more contrasting (Figs. 49, 50). Upper spur of hind tibia shorter than 1st tarsal segment. Parameres with long processes (Fig. 51). Spur of fore tibia in ♀ more slender (Fig. 22). Body length 3.5–5.0 mm 9. *A. planus* D. Kosh.

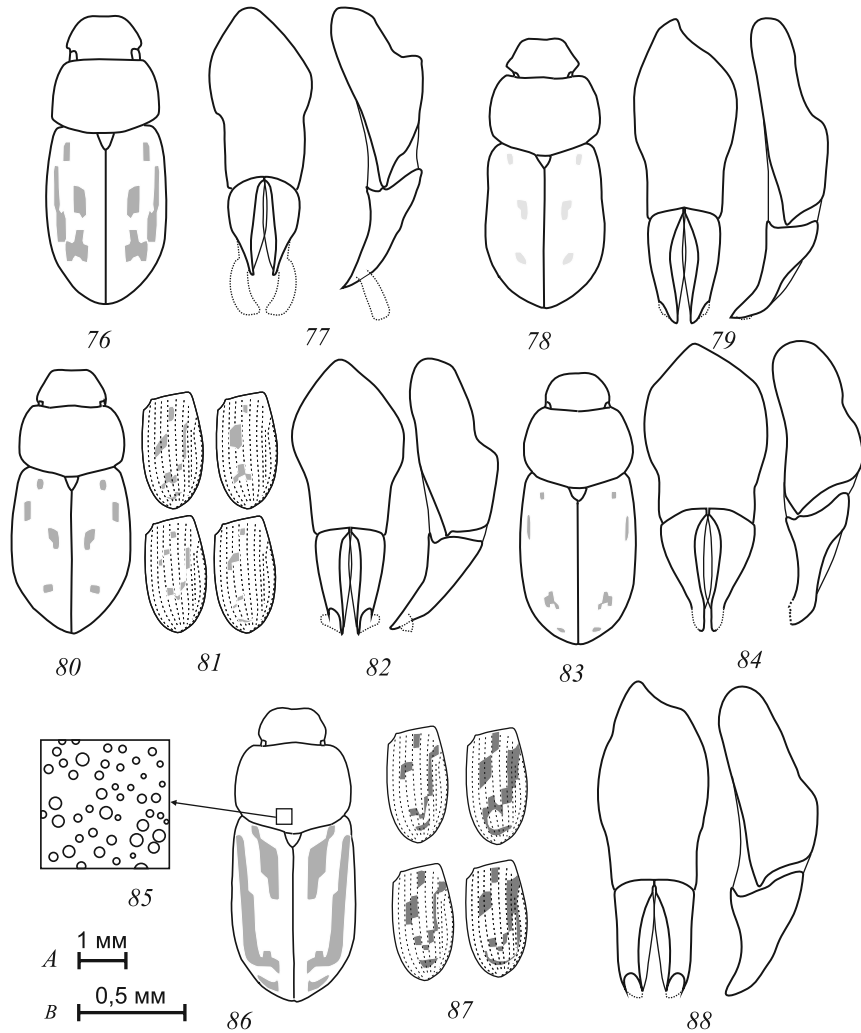
—Elytral pattern considerably varying, background usually darker or dark color prevailing (Figs. 62, 63). Upper spur of hind tibia as long as 1st tarsal segment. Parameres without long processes

(Fig. 64). Spur of fore tibia in ♀ longer and thicker (Fig. 23). Body length 4.0–5.0 mm 6. *A. clathratus* Reitt.

13 Head granulate. Body small (2.7–3.8 mm). Elytra with dark maculae usually merging along 3rd–4th intervals (Figs. 98, 99). Aedeagus as in Fig. 100 21. *A. clausula* W. Kosh.

—Head with more or less pronounced punctation, but not granulate. Size usually larger 14.

14. Anterior corners of clypeus pale, genae very small (Fig. 7). Elytra with dark striae and characteristic pattern (Fig. 57). Aedeagus as in Fig. 58. Body length 4.0–5.5 mm 31. *A. sticticus* (Panz.).



Figs. 76–88. *Aphodius* Ill. (76, 78, 80, 83, 86) Male habitus; (77, 79, 82, 84, 88) aedeagus, dorsal and lateral view; (81, 87) elytral pattern; (85) punctation of pronotal disc in ♀ [square side 0.33 mm]. (76, 77) *A. balachanicola* Balth.; (78, 79) *A. variicolor* D. Kosh.; (80–82) *A. xanthellus* sp. n.; (83, 84) *A. mongolaltaicus* Nikolajev; (85–88) *A. nigrivittis* Sols. (A) scale for Figs. 76, 78, 80, 83, 86; (B) Figs. 77, 79, 82, 84, 88.

—Anterior corners of clypeus dark. Elytra with different pattern, striae not infuscate 15.

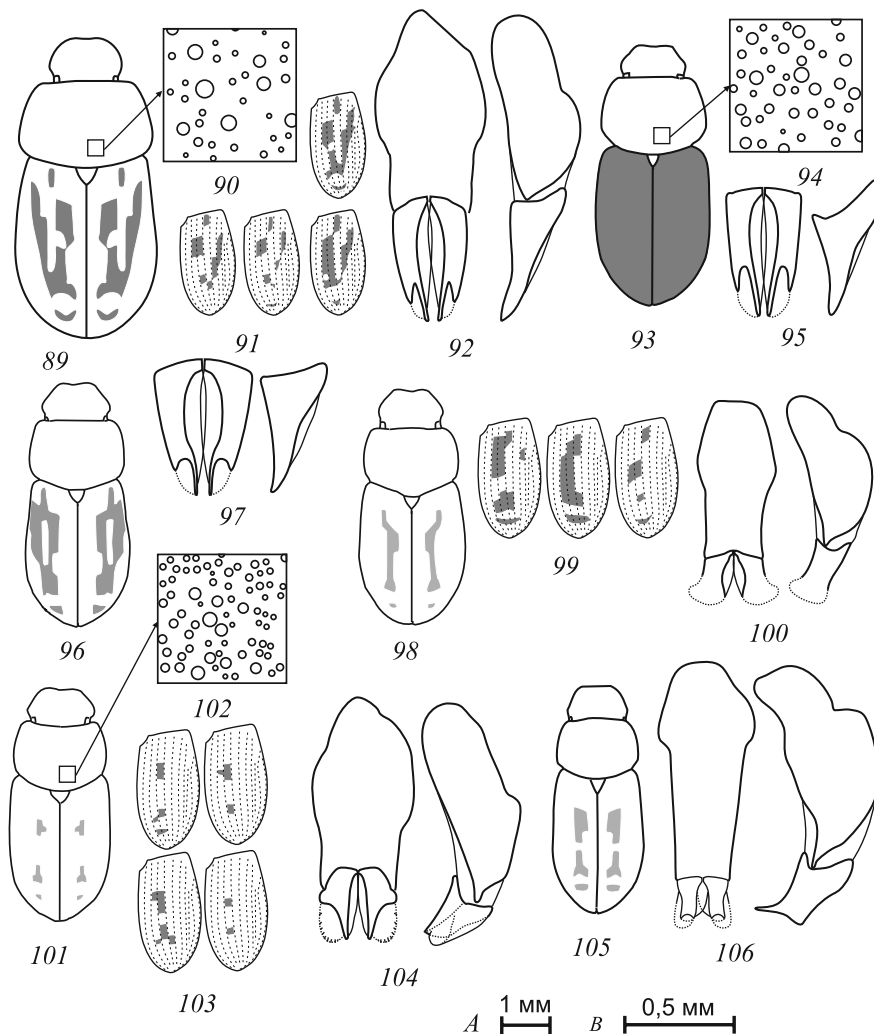
15. Body smaller (3.0–4.0 mm). Elytra straw-yellow or yellowish brown, with poorly developed pattern (Figs. 101, 103, 105, 107) or immaculate. Sutural interval not infuscate. Pronotum black or dark brown. If pronotum brown, then elytral pattern consisting of longitudinal maculae on interval 4 and near apex. Fore tibia in ♂ of common shape, not parallel-sided 16.

—Body longer (4.0–6.0 mm). Elytral pattern usually more developed. If body small (3.7–4.0 mm), then pattern formed by a few black maculae and sutural

interval entirely black, or pronotum and elytral maculae (often merged into two longitudinal stripes) brown, or elytra entirely brown, but not straw-yellow. Fore tibia in ♂ of usual shape or narrow and parallel-sided 19.

16. Elytral pattern usually consisting of two maculae on intervals 3–4 and small macula near apex (Figs. 101, 103, 105). Occasionally maculae merging along interval 4, rarely elytra immaculate. Pronotum in ♀ more sparsely punctate (Fig. 102) 17.

—Elytra without dark maculae or with small macula on interval 8. Pronotum in ♀ more densely punctate (Fig. 108) 18.



Figs. 89–106. *Aphodius* Ill. (89, 93, 96, 98, 101, 105) Male habitus; (90, 94, 102) punctation of pronotal disc in ♀ [square side 0.33 mm]; (91, 99, 103) elytral pattern; (92, 100, 104, 106) aedeagus, dorsal and lateral view; (95, 97) parameres, dorsal and lateral view.; (89–92) *A. praenubilis* Balth.; (93–95) *A. kerzhneri* Nikolajev; (96, 97) *A. exilimanus* Kabakov; (98–100) *A. clausula* W. Kosh.; (101–104) *A. comma* Reitt.; (105, 106) *A. zaissanicus* Nikolajev. (A) scale for Figs. 89, 93, 96, 98, 101, 105; (B) Figs. 92, 95, 97, 100, 104, 106.

17. Disc of pronotum black. Spur of fore tibia slightly incurved (Fig. 24). Upper spur of hind tibia slightly shorter than 1st tarsal segment. Aedeagus as in Fig. 104. Body length 3.3–4.0 mm
..... 20. *A. comma* Reitt.

—Disc of pronotum dark brown. Spur of fore tibia outcurved (Fig. 25). Upper spur of hind tibia slightly longer than 1st tarsal segment. Aedeagus as in Fig. 106. Body length 4.0 mm
..... 22. *A. zaissanicus* Nikolajev (♂).

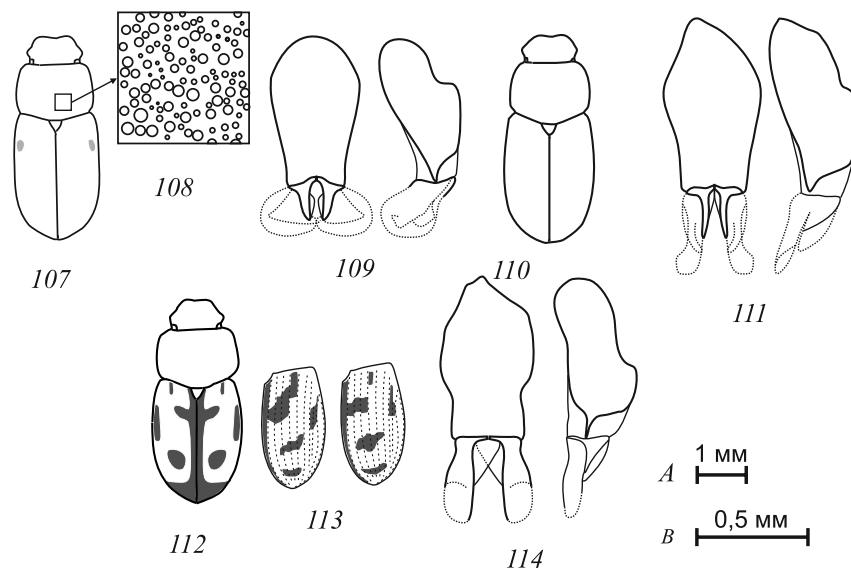
18. Head and pronotum black. Anterior and lateral parts of clypeus not paler than disc, or only lateral margins paler. Elytral interval 8 with small black

macula near shoulder (Fig. 107); occasionally dark macula present near elytral apex; rarely elytra immaculate. Legs brown. Aedeagus as in Fig. 109. Body length 3.0–3.8 mm
..... 27. *A. flavimargo* Reitt.

—Head and pronotum dark brown. Sides of clypeus reddish brown. Elytra immaculate. Legs reddish brown. Aedeagus as in Fig. 111. Body length 3.2–4.0 mm
..... 28. *A. badenkoi* Nikolajev.

19. Head, pronotum and elytral maculae brown or pale brown; occasionally elytra immaculate 20.

—Head and pronotum black. Elytral maculae brown or black 28.



Figs. 107–114. *Aphodius* Ill. (107, 110, 112) Male habitus; (108) punctuation of pronotal disc in ♀ [square side 0.33 mm]; (109, 111, 114) aedeagus, dorsal and lateral view; (113) elytral pattern. (107–109) *A. flavimargo* Reitt.; (110, 111) *A. badenkoi* Nikolajev; (112–114) *A. figuratus* A. Schm. (A) scale for Figs. 107, 110, 112; (B) Figs. 109, 111, 114.

20. Width of eye in ventral view about twice minimum interval between eye margin and gula (Figs. 8, 10) 21.
 —Width of eye in ventral view equal to, or less than minimum interval between eye margin and gula (Fig. 9) 24.
21. Fore tibia in ♂ narrow and parallel-sided (Fig. 26). Disc of metasternum glabrous. Elytra in ♂ very finely pubescent. Epipleura in ♀ glabrous in posterior part. Elytra with small pale brown maculae (Fig. 83). Aedeagus as in Fig. 84. Body length 5.0–5.5 mm. Mongolia, southern Siberia (Altai Mts.) 26. *A. mongolaltaicus* Nikolajev.
 —Fore tibia in ♂ of usual shape (Figs. 27, 28); disc of metasternum in ♂ with setae; posterior part and sides of elytra in ♂ with relatively long setae. Epipleura in ♀ with setae. Southwestern Russia, Kazakhstan, Middle Asia 22.
22. Genae, sides of pronotum, and shoulders with long dense setae; genae angular. Fore tibia with long slender outer teeth (Fig. 27). Elytral pattern poorly developed (Fig. 78). Aedeagus as in Fig. 79. Body length 5.0–6.0 mm 23. *A. variicolor* D. Kosh.
 —Genae, sides of pronotum, and shoulders with shorter and sparser setae; genae more or less rounded or obtuse. Fore tibia with shorter outer teeth (Fig. 28). Elytral pattern usually more contrasting (Figs. 76, 80, 81) 23.
23. Smaller (4.0–5.2 mm). Pronotum more sparsely punctate (punctures on disc separated by 2–4 their diameters). Parameres with short processes (Fig. 82) 24. *A. xanthellus* sp. n.
 —Longer (5.7–6.2 mm). Pronotum more densely punctate (punctures on disc separated by 1–2 their diameters). Parameres with long processes (Fig. 77) 25. *A. balachanicola* Balth.
24. Metasternum glabrous 25.
 —Metasternum with setae 26.
25. Fore tibia in ♂ narrow (Fig. 29). Head and pronotum dark brown. Elytra straw-yellow with contrasting brown maculae (Figs. 89, 91). Parameres without processes (Fig. 92). Body length 4.0–5.5 mm. Tien Shan Mts.
 13. *A. praenubilis* Balth. (pars).
 —Fore tibia in ♂ of usual shape. Head and pronotum brown or pale brown, usually with reddish tint. Elytra pale brown with less contrasting brown maculae. Parameres with long processes (Fig. 73). Body length 4.5–5.3 mm. Altai Mts., Mongolia
 19. *A. jacobsoni* W. Kosh.
26. Elytral pattern consisting of 2 brown longitudinal strips (Fig. 74) only slightly darker than background, occasionally indistinct. Parameres as in Fig. 75. Body length 3.5–4.8 mm. The Pamirs
 18. *A. pamirensis* Medv.

—Elytral pattern consisting of brown, almost always contrasting maculae (Figs. 68–70); rarely each elytron with one large dark macula occupying most part of its surface, or elytra uniformly brown. Southern Siberia and Mongolia 27.

27. Apices of parameres slender (Fig. 72). Genae in ♀ virtually not protruding past eyes. Body length 4.0–5.3 mm 17. *A. tanhensis* Frolov.

—Apices of parameres broader (Fig. 71). Genae in ♀ more or less protruding past eyes. Body length 4.5–5.3 mm 16. *A. grafi* Reitt.

28. Sutural interval black. Elytral pattern formed by 5 black maculae and small macula on base of interval 5 (Figs. 112, 113). Anterior corners of pronotum pale. Aedeagus as in Fig. 114. Body length 3.5–4.0 mm 29. *A. figuratus* A. Schm.

—Sutural interval pale brown at least in anterior part. Elytral pattern formed by brown or black-brown maculae occasionally fused along intervals 3–4 and 6–7; dark color occasionally predominating; rarely entire elytra pale. Sides or anterior corners of pronotum pale 29.

29. Body narrower (Fig. 86). Fore tibia in ♂ of usual shape, its spur as long as 2 first tarsal segments combined (Fig. 30). Pronotum in ♀ densely irregularly punctate (Fig. 85). Usually only anterior corners of pronotum paler than disc, rarely sides with narrow pale line. Spur of fore tibia in ♀ reaching middle of 2nd tarsal segment. Aedeagus as in Fig. 88. Body length 4.5–6.0 mm 12. *A. nigrivittis* Sols.

—Body usually wider. Fore tibia in ♂ slender and almost parallel-sided, its apical spur shorter (Fig. 29, 31, 32). Sides of pronotum usually pale brown. Pronotum in ♀ sparsely punctate (Fig. 90); if pronotum densely punctate (Fig. 94), then spur of fore tibia not reaching middle of 2nd tarsal segment. 30.

30. Most part of elytra pale brown. See also 25. 13. *A. praenubilis* Balth. (pars).

—Most part of elytra dark brown 31.

31. Elytra uniformly dark brown. Parameres as in Fig. 95. Body length 4.0–5.5 mm. Southern Siberia and Mongolia 15. *A. kerzhneri* Nikolajev.

—Elytra mostly with maculae (Fig. 96). Parameres as in Fig. 97. Body length 4.2–4.8 mm. Volga area 14. *A. exilimanus* Kabakov.

1. *Aphodius (Chilothorax) conspurcatus* (Linnaeus, 1758) (Figs. 5, 33–35)

Diagnosis. The species is similar to *A. paykulli* and *A. pictus*, but can be distinguished from them by pale anterior angles of clypeus and less developed elytral pattern.

Distribution. Europe.

Material. Russia. Yaroslavl Prov., 1.IX.1895, 2 specimens; 9.IX.1896, 1 specimen; 16.IV.1906, 3 specimens (A. Yakovlev); Leningrad Prov.: 30 km NW of St. Petersburg, 1 specimen; Ligovo, 11.IV.1911, 1 specimen (G. Jacobson). Belarus. Brest Prov., Kamenyuki, 24.IV.1998, 1 specimen (A. Frolov).

2. *Aphodius (Chilothorax) paykulli* Bedel, 1798 (Figs. 12, 39–41)

= *A. tessulatus* Duftschmid, 1805.

Diagnosis. The species is the most similar to *A. conspurcatus* and *A. pictus* but can be distinguished from the former by the uniformly colored clypeus and from the latter by angulate posterior margin of hind femur in ♂ and more densely punctate pronotum in ♀.

Distribution. Central Europe, Transcaucasus, Asia Minor.

Material. Russia. St. Petersburg, 1 specimen (E. Koenig); Daghestan, Derbent, 20.XII.1916, 2 specimens (G. Olsoufieff). Belarus. Vitebsk Prov., Domzheritsy, 6.X.1995, 1 specimen (E. Shaverdo). Georgia. Lagodekhi, 1896, 1 specimen (Mlokosiewicz).

3. *Aphodius (Chilothorax) pictus* Sturm, 1805 (Figs. 36–38)

Diagnosis. The species is the most similar to *A. conspurcatus* and *A. paykulli* but can be distinguished from the former by the uniformly colored clypeus and from the latter by the rounded posterior margin of hind femur in ♂ and more sparsely punctate pronotum in ♀.

Distribution. Central and southern Europe, Caucasus.

Material. Ukraine. Crimea: Kerch, 6.XI.1901, 5 specimens; Sevastopol, 2 specimens (V. Pliginskiy); Odessa, 12.IV.1920, 1 specimen (D. Znoiko); Kamenets-Podolskiy, 20.III.1911, 2 specimens (V. Yakubovskiy).

4. *Aphodius (Chilothorax) plustschewskii* D. Koshantschikov, 1894 (Figs. 2, 11, 13, 17, 42, 43)

Diagnosis. This species can be distinguished from the representatives of the subgenus *Chilothorax* in the

region under consideration by densely pubescent inner margin of hind tibia in ♂, and from most of species by angulate posterior margin of hind femur and shortened lower spur of middle tibia in ♂.

Distribution. Described from Ural Province of Kazakhstan (Urda). Southeastern part of European Russia (Volga area), Kazakhstan (Ili River valley).

Material. Lectotype ♀ (Frolov, 1996) labeled "Khanskaya stavka [Urda], Astrakhan gub., Plustsch-Plustsch" and "*Aphodius plustschewskyi* Typ Kosh.;" paralectotypes ♂ and ♀ (designated here) labeled "Chanskaja Stawka," "*Aphodius Plustschews.*," "Plustsch [Plustschewskiy-Plustschik leg.]," "*A. Plustschewskyi* D. Kosh. ♂ [♀] W. Koshantschikov det."

Kazakhstan. Uralsk Prov., Chapaeusk Distr., 25.X.1980, 2 specimens (G. Nikolajev).

5. *Aphodius (Chilothorax) melanostictus* W. Schmidt, 1840 (Figs. 6, 59–61)

Diagnosis. The species is the most closely related to *A. auliensis*, *A. clathratus*, and *A. distinctus* but can be distinguished from the first by the shape of parameres and presence of dark macula on the base of elytral interval 5, from the second by the glabrous disc of metasternum and different elytral pattern, and from the third by the glabrous disc of metasternum, shape of aedeagus, and pale in most individuals sides of pronotum.

Distribution. Europe, Mediterranean, Middle Asia, Kazakhstan, western Siberia.

Material. Russia. Birsk, 1918, 3 specimens (Kosakovskiy); Tobolsk, 22.V.1925, 1 specimen (Fridolin); Omsk, 15.VII.1912, 4 specimens (Vydrina); Barnaul, 6–17.VII.1901, 9 specimens (Z. Goretovskiy); Krasnoyarsk, 20.VII.1910, 5 specimens (Potalitsyn); Minusinsk, 12.V.1912, 1 specimen (Sushkin, Redikortsev); Kansk, 28.VI.1915, 5 specimens (Valdaev); Irkutsk, 9.VIII.1912, 2 specimens (Kaidalov); Ust'-Kut, 13.V.1912, 2 specimens (Naumov); Buryatia, Mal'ta, 29.VII.1907, 2 specimens (D. Smirnov). Belarus. Minsk Distr., Priluki, 26.VIII.1963, 1 specimen (P. Bogush). Ukraine. Kamenets-Podolskiy, 14.III.1911, 11 specimens (Yakubovskiy); Crimea: Simferopol, 7.VI.1930 (Kiritschenko); Kerch, 1907, 29 specimens (Kiritschenko). Armenia. Erevan, 17.III.1936, 6 specimens (Ter-Minassian, Richter). Azerbaijan. Bozardyuzyu, 1892, 6 specimens (Shelkovnikov). Turkmenistan. Ashkhabad, 1.IV.1960, 3 specimens (Stepa-

nov), 28.III.1952, 8 specimens (Romadina); Bairam-Ali, 17.II.1912, 10 specimens (D. Smirnov); Imam-Baba, 6–24.III.1912, 1 specimen (Koshantschikov). Kirghizia. Przhevalsk, 26.III.1908, 3 specimens (Pedashenko); Yur'evskoe, 21.VII.1993, 2 specimens (S. Saluk); 20 km SE of Pokrovka, 22.V.1988, 1 specimen (Egorov); Bozbutau Mts., 1.V.1961, 1 specimen (Zaslavsky). Uzbekistan. Dzhizak, 27.III.1903, 3 specimens (G. Jacobson), 4.IV.1995, 3 specimens (A. Frolov); Samarkand, 6–24.II.1896, 3 specimens (L. Barshevskiy); Golodnaya Step', 20.V.1903, 6 specimens (G. Jacobson). Kazakhstan. Uralsk Prov., Aleksandrovka, 20.VIII.1987, 5 specimens (Levitskiy); Yanvartsevo, 30.VI.1949, 62 specimens (Romadina); Uralsk, 19.V.1906, 23 specimens (B. Uvarov); Chelkar, 28–30.IV.1986, 2 specimens (G. Nikolajev); Muryunkum Desert, Akyr-Tobe, 8.IV.1982, 1 specimen (G. Nikolajev); 40 km W of Chu Mts., 27.III.1982, 2 specimens (G. Nikolajev); Alma-Ata, 7.VI.1928, 1 specimen (K. Titov).

6. *Aphodius (Chilothorax) clathratus* Reitter, 1892 (Figs. 15, 23, 62–64)

Diagnosis. The species is the most closely related to *A. melanostictus*; some color aberrations are similar to *A. planus*. It can be distinguished from *A. melanostictus* by the sparsely pubescent disc of metasternum, and from *A. planus* by the shape of the aedeagus and spur of fore tibia.

Distribution. The species was described from Ordubad (Azerbaijan). Nikolajev (1987) reported it from Caucasus, Turkey, Iran, and Middle Asia (Kyzyl Kum Desert). The range of this species needs further investigation.

Material. Armenia. Erevan, 17.III.1936, 15 specimens (Richter). Turkmenistan. Mary, II.1921, 9 specimens; Iolotan', 10.XII.1926, 1 specimen (Kizeritskiy). Tajikistan. Pendzhikent, 10.XII.1943, 1 specimen (Kiritschenko).

Note. *A. fritschi* Balth., *A. propola* Balth., and *A. dobrovljansky* W. Kosh., described from, respectively, Iraq, Kirghizia, and Armenia, are probably synonyms of *A. clathratus*. The shape of aedeagi of type specimens of these species (except for *A. fritschi* described from single female) is very similar and does not differ from that in *A. melanostictus*. Because the type of *A. clathratus* is not available for examination, it is impossible to solve finally the problem of the synonymy.

7. *Aphodius (Chilothorax) auliensis* Balthasar, 1938
(Figs. 54–56)

Diagnosis. The species is the most closely related to *A. melanostictus* and *A. clathratus*, but can be distinguished by the upwards-curved apices of the parameres and absence of dark macula on the base of elytral interval 5.

Distribution. Described from Dzhambul. Kazakhstan, Turkmenistan.

Material. Lectotype (designated here): ♂ labeled “Aulia Ata [Dzhambul]”, “TYPUS”, “*A. (Volinus) auliensis* n. sp. m. Dr. V. Balthasar det.” (NMPC).

Kazakhstan. Baigakum, III.1912, 1 specimen (Koshantschikov); Dzhambul, 4 specimens (E. Fischer); Mujunkum Desert, 8.IV.1982, 4 specimens (G. Nikolajev); Chu River valley, 27.III.1982, 15 specimens (G. Nikolajev); Malaisary, 24.III.1983, 6 specimens (G. Nikolajev). Kirghizstan. Talas, III.1907, 2 specimens (E. Fischer). Turkmenistan. Turkestan [railroad station], 20.III.1952, 1 specimen (O. Kryzhanovskij).

8. *Aphodius (Chilothorax) distinctus* (Müller, 1776)
(Figs. 14, 16, 44–46)

= *A. inquinatus* (Herbst, 1783).

Diagnosis. The species is the most closely related to *A. melanostictus* and *A. clathratus*, but can be distinguished from them by the shape of the parameres, densely pubescent in ♂ and glabrous in ♀ disc of metasternum.

Material. Russia. Moscow Prov., Klin, 26.IV.1906, 8 specimens (D. Smirnov); Vladimir Prov., Pervomayskiy, 16.IX.1966, 38 specimens (Nikonova); Volgograd, 26.V.1890, 2 specimens (G. Suvorov); Tyumen, 11.V.1925, 8 specimens (Fridolin); Irkutsk Prov., Ust'-Kut, 14.V.1909, 1 specimen (Naumov). Belarus. Minsk Prov., Rovnopol'e, 20.V.1994, 40 specimens (A. Frolov); Vitebsk Prov., Domzheritsy, 6.X.1995, 1 specimen (E. Shaverdo); Brest Prov., Kamenyuki, 27.IV.1994, 15 specimens (A. Frolov). Ukraine. Crimea: Baidary, 17.IV.1907, 1 specimen (Yatsentkovskiy); Evpatoria, 16.XI.1905, 1 specimen (V. Yakovlev); Kerch, 1907, 8 specimens (Kiritschenko); Sudak, 21.IV.1904, 3 specimens (D. Glazunov); Khmel'nitskaya Prov., Kamenets-Podolskiy, 5.IV.1909, 7 specimens (V. Yakubovskiy). Georgia. Tbilisi, 3 specimens (E. Koenig). Armenia. Erevan, 17.III.1936, 5 specimens (Ter-Minassian, Richter). Azerbaijan. Baku, 1 specimen. Turkmenistan: Murgab River, II.1912,

1 specimen. Kazakhstan. Temir, 27.IV.1908, 45 specimens (D. Borodin, B. Uvarov); Kainar, 1892, 1 specimen (Glasunov); Chelkar, 28.IV.1986, 2 specimens (G. Nikolajev).

Distribution. Europe, northern Africa, Middle Asia, Asia Minor, Kazakhstan, Russia (as far as Altai Mts. to the east), North America (introduced).

9. *Aphodius (Chilothorax) planus* D. Koshantschikov,
1894 (Figs. 4, 21, 22, 49–51)

= *A. transvolgensis* Semenov, 1898.

Diagnosis. The species is most similar to *A. flammulatus* and *A. clathratus* but can be distinguished from them by the shape of the parameres, from the former also by the more contrasting elytral pattern and the shape of the spur of fore tibia.

Distribution. Described from environs of Orenburg. Occurs in the southeastern part of European Russia, southern Ukraine, Turkmenistan, northwestern Kazakhstan. According to Nikolajev (1987), the species is distributed throughout northern Kazakhstan to Altai Mts. in the East.

Material. *A. transvolgensis*. Two syntypes (♂) labeled “Pr. Turgai 92,” “*inquinatus centrolineatus* Panz.,” “*Aphod. transvolgensis* m., Typ. I.98, A. Semenow det.,” “*Aphod. planus*, ♀ var. Kosh., XII.98, A. Semenow det.” and “Sarepta, A. Becker” [in Russian], “*Aphod. transvolgensis* m., Typ. I.98, A. Semenow det.,” “*Aphod. planus* Kosh., ♀ var., XII.98, A. Semenow det.”

Russia. Saratov, Privolzhskoe, 5.VI.1977, 2 specimens (Tereshko); Krasnodar Terr., Eysk, 7.V.1920, 2 specimens (Mischenko); Volgograd, 1 specimen (Semenov-Tian-Shansky). Ukraine. Askania Nova, 6.IV.1928, 31 specimens; 5 VI 1928, 9 specimens; 24.III.1928, 6 specimens (S. Medvedev). Kazakhstan. Karaganda Prov., Ulutau, 26.VI.1958, 1 specimen (Loginova); Uralsk, 18.IV.1907, 2 specimens (D. Borodin); Temir, 18.IV.1908, 7 specimens (D. Borodin, B. Uvarov); Chelkar, 28.IV.1986, 1 specimen (G. Nikolajev). Turkmenistan. Kopet Dagh Mts., 29.IV.1968, 5 specimens.

10. *Aphodius (Chilothorax) flammulatus* Harold,
1876 (Figs. 19, 20, 52, 53)

Diagnosis. The species is similar to *A. planus* and *A. clathratus*, but can be distinguished by the reddish elytra with weakly contrasting pattern, hook-shaped spur of fore tibia in ♂, and shape of the parameres.

Distribution. Described from Tsalka (Georgia). Occurs in the Caucasus and Transcaucasus.

Material. Georgia. Tbilisi: 5.III–19.IV.1911, 10 specimens (E. Koenig), 24.III.1910, 2 specimens (K. Satunin); 9.IV.1929, 6 specimens (Kirschenblat), 18.III.1934, 4 specimens (A. Bogachev). Azerbaijan. Baku, 17.III.1933, 6 specimens (A. Bogachev); Evlakh, 29.III.1960, 2 specimens (O. Kabakov).

Note. This species was placed by some authors in the subgenus *Nobius* Muls. because of the similar elytral pattern.

11. *Aphodius (Chilothorax) ivanovi* Lebedev, 1912
(Figs. 47, 48)

Diagnosis. This species can be easily distinguished from other representatives of the subgenus *Chilothorax* by head sculpture. From species of the subgenus *Mendidius* Harold it can be distinguished by the presence of dark maculae on the elytra and the shape of aedeagus.

Distribution. Described from environs of Kazan. Russia (Volga area).

Material. Russia: Penza, 10.V.1921, 1 specimen (G. Dmitriev); 10.V.1921, 12 specimens (G. Olsoufiev).

Note. This species was originally described in the subgenus *Mendidius*, based on its coarsely granulate head. However, a complex of characters (structure of the aedeagus, elytral pattern, and general appearance) allows one to place it in the subgenus *Chilothorax*.

12. *Aphodius (Chilothorax) nigrivittis* Solsky, 1876
(Figs. 3, 30, 85–88)

Diagnosis. The species is most closely related to *A. praenubilis* and to *A. altaicus* Nikolajev, distributed in Mongolia and northeastern China, and can be distinguished from them by the shape of the parameres and, from the former, also by the shape of fore tibia in ♂.

Distribution. Described from Uzbekistan (Kokand). Also distributed in Kazakhstan, Turkmenistan, Tajikistan, and Kirghizstan.

Material. Turkmenistan. Kopet Dagh Mts., Chuli, 22–25.V.1913, 5 specimens. Uzbekistan. Kokand, 2 specimens. Tajikistan. Chechekty, 13.VII.1964, 1 specimen (G. Medvedev); Turkestanskii Range, Lake Kara-Kul-Kitta, 25.VI.1963, 1 specimen; Turkestanskii Range, Shakhristan Pass, VII.1977, 1 speci-

men; 2 km of Ak-Tash (Pshart) Pass, Kara-Dzhigla River, 22.VI.1958, 17 specimens (K. Gorodkov); Hissar Range, Anzob, 4.VII.1947, 3 specimens (Kiritschenko); VII.1970, 1 specimen (V. Dolin); Petra Pervogo Range, 26.VI.1911, 1 specimen. Kirghizstan. Sary-Tash, 8.VII.1995, 2 specimens (A. Koval'); 27.VI.1928, 21 specimens (Reichardt); Berk-Sun River, 7.VII.1995, 3 specimens (A. Koval'); Atbashi, 13.VI.1959, 3 specimens (Zaslavsky); Alai Range, 17.VII.41 specimens, 13.VI.1889, 25 specimens; Naryn, 14 specimens (Datsenko); 8 specimens (Nezhivov); Irkeshtam, 16.VII.1935, 1 specimen (G. Olsoufiev); Kyzyl-Art River, 28.VII.1948, 2 specimens (Kiritschenko); Sary-Kol Range, 6.VII.1928, 1 specimen (Reichardt).

13. *Aphodius (Chilothorax) praenubilis* Balthasar, 1933 (Figs. 29, 89–92)

= *A. stichai* Balthasar, 1933 (synonymy after Nikolajev, 1976).

Diagnosis. The species is the most closely related to *A. nigrivittis*, *A. exilimanus* and *A. kerzhneri*. It can be distinguished from the first of these by narrow fore tibia with shorter spur in ♂ and wider body. From the other two species it can be distinguished by paler (brown to dark brown) and more sparsely punctate pronotum and by elytral pattern. It does not differ from the two subsequent species in the shape of parameres.

Distribution. Mountain regions of Middle and Central Asia: Tien Shan, Kunlun, and probably Nan Shan.

Material. Tajikistan. Balyandkiik River, Zulumart Range, 6.VIII.1958, 1 specimen (K. Gorodkov); Chechekty, 13.VII.1964, 6 specimens (G. Medvedev). Kirghizstan. Alai Range, 17.VII.22 specimens; Alai Range, 2 km W of Sary-Tash, VII.1965, 11 specimens (Guryeva); Naryn, 12 specimens (Datsenko), 6.VI.1905, 1 specimen (Nezhivov); Sary-Tash, 27.VI.1928, 1 specimen (Reichardt); 8.VII.1995, 5 specimens (A. Koval').

Note. Balthasar (1933) described two species, *A. praenubilis* and *A. stichai*, from Naryn River valley and designated a female as the type specimen of the first species and a male as the type of the second one. Nikolajev (1976) supposed that both these names refer to the same species and selected *A. praenubilis* as the valid name. Having examined numerous specimens of *A. praenubilis* and *A. nigrivittis* from allopatric (*A. nigrivittis* from Kopet Dagh and *A. praenubilis*

from Kunlun) and sympatric (from Central Tien Shan) populations, I could not find reliable morphological differences between the females of the two species. Therefore, it is possible that the type specimen of *A. praenubilis* belongs to *A. nigrivittis*.

14. *Aphodius (Chilothorax) exilimanus* Kabakov, 1994 (Figs. 32, 96, 97)

Diagnosis. The species is the most closely related to *A. praenubilis* and especially to *A. kerzhneri* Nikolaev. It can be distinguished from the former by denser punctures on pronotum and head, and from the latter by the maculate in most specimens elytra.

Material. Holotype and 20 paratypes labeled "Ulyanovsk Prov., Novospassk Distr., Zyково, 23.V.1990" and "in marmot dung, Isaev A. leg." (in Russian). The species is known only from the type specimens.

15. *Aphodius (Chilothorax) kerzhneri* Nikolajev, 1984 (Figs. 31, 93–95)

Diagnosis. The species is the most closely related to *A. exilimanus* and *A. praenubilis* and can be distinguished from them by uniformly dark brown elytra, from the second species also by more densely punctate pronotum and head.

Distribution. Mongolia and southwestern Siberia.

Material. Russia: southeastern Altai Mts., left tributary of Dzhazator River, 6 km W of Zhumala mouth, 28.IV.1998, 37 specimens (V. Zinchenko).

16. *Aphodius (Chilothorax) grafi* Reitter, 1902 (Figs. 68, 69, 71)

= *A. kryzhanovskii* Nikritin, 1969, **syn. n.** (holotype ♀ and paratypes ♂ and 2 ♀: southeastern coast of Lake Baikal, Barguzin, 21.VIII.1968, Borisov); = *A. schutovae* Nikritin, 1969, **syn. n.** (holotype ♀ and paratype ♀: Ussuri Terr., Suputinsky Reserve, Vinogradovka, 16.V.1956, D'yachenko [probably, the specimen is mislabeled]).

Type material is deposited at the Zoological Museum of the Moscow State University (Moscow).

Diagnosis. The species is the most similar to *A. tanhensis*, *A. jacobsoni*, *A. pamirensis*, and *A. alexis* Frolov, described from Mongolia (Khangai Mts.) and can be reliably distinguished from them only by the shape of the parameres. It also differs from *A. jacobsoni* in the pubescent disc of metasternum in both sexes and

from *A. pamirensis* in the usually more contrasting elytral pattern.

Distribution. Southwestern Siberia (Altai Mts.) and Mongolia.

Material. Russia. Altai Mts., Kosh-Agach, 20–22.VI.1907, 90 specimens; 14.VI.1964, 3 specimens (Narchuk); Yustyd Range, 2.VII.1907, 10 specimens; Lake Teletskoe, Kokshi River, 2 specimens (A. Emel'yanov); Irkutsk, 5 specimens (Reitter).

17. *Aphodius (Chilothorax) tanhensis* Frolov, 2001 (Figs. 70, 72)

Diagnosis. The species is the most similar to *A. grafi* but can be reliably distinguished from it by the shape of the parameres.

Distribution. Mongolia and southwestern Siberia (Altai Mts.).

Material. Russia. Altai Mts., Taldur, 6.VIII.1925, 1 specimen (Sushkin, Redikortsev).

18. *Aphodius (Chilothorax) pamirensis* Medvedev, 1928 (Figs. 74, 75)

Diagnosis. The species is similar to *A. grafi*, *A. tanhensis* and *A. jacobsoni*, distributed in Mongolia and southern Siberia, and can be distinguished from them by the less contrasting elytral pattern and the shape of the parameres, from *A. jacobsoni* also by the pubescent disc of metasternum.

Distribution. Tajikistan, Kirghizstan.

Material. Lectotype ♂ (designated here) labeled "khr. Sary-kol kit. gr. Pamira 4300 m. Reichardt, 11.VII.28" [in Russian] and "*Aph. (Volinus) pamirensis* m. sp. n. Typ. ♂, S. Medvedev det." paralectotypes: 9 ♀ labeled "Pamir, s.-v. bereg oz. Kara-kul", Reichardt 6.VII.28" [in Russian] (1 specimen also bears the label "*Aph. (Volinus) pamirensis* sp. n. Cotyp. ♀, S. Medvedev det.").

Tajikistan. Chechekty, 13.VII.1964, 1 specimen (G. Medvedev); Lake Zorkul, 2.VII.1909, 8 specimens (A. Jacobson); Aksu River, 7.VI.1909, 3 specimens (A. Jacobson). Kirghizstan. Alai Range, 9.VI.1889, 119 specimens; Susamyr River, 17.V.1914, 1 specimen (Mikhalevskaya); Atbashi, 13.VI.1959, 1 specimen (Zaslavsky).

19. *Aphodius (Chilothorax) jacobsoni* W. Koshantschikov, 1911 (Figs. 9, 73)

Diagnosis. It differs from similar species (*A. tanhensis*, *A. grafi*, *A. pamirensis*, *A. alexis*) in the shape of parameres and glabrous disc of metasternum.

Material. Russia: southwestern Siberia; Abakan, 18–19.V.1912, 17 specimens (Sushkin, Redikortsev); 14.VI.1897, 1 specimen (A. Jacobson); Kosh-Agach, 17.VI.1989, 2 specimens (S. Saluk).

Distribution. Southern Siberia and Mongolia.

20. *Aphodius (Chilothorax) comma* Reitter, 1892
(Figs. 24, 101–104)

Diagnosis. The species is the most similar to *A. zaissanicus* and can be distinguished from it by black disc of pronotum, incurved spur of fore tibia and by the shape of the aedeagus.

Distribution. Northern Kazakhstan, southern Siberia, Mongolia.

Material. Russia. Southwestern Siberia: Tyumen Prov., Tyumen, 12.V.1925, 19 specimens (Fridolin); Kemerovo Prov., Tisul', 9.VI.1894, 16 specimens (Gorchakovskiy); Kuznetsk (=Novokuznetsk), 28.V.1908, 1 specimen (Khvorov); Altai Terr.: Chuya River, Chachan-Uzun, 1.IV.1989, 4 specimens (S. Saluk); Barnaul, 26.V.1906, 3 specimens. Republic of Altai: Ten'ga, 12.VI.1907, 55 specimens. Krasnoyarsk Terr.: Minusinsk, 12.V.1912, 40 specimens (Sushkin, Redikortsev). Khakasia: Tashtyp, 30.V.1912 (Sushkin), 10 specimens (Sushkin, Redikortsev). Irkutsk Prov.: Kirensk, 15.V.1904, 2 specimens (Braudo); Ust'-Kut, 2.VI.1927, 1 specimen (A. Popov); 2.VI.1925, 4 specimens (Ivanov). Chita Prov., Chita, VI.1916, 11 specimens (Yurkevich). Yakutia: Yakutsk, 1901, 1 specimen (Olenin). Amur Prov., Zeya, IV–V.1914, 1 specimen (Koshantschikov). Kazakhstan. Kokchetav, 13.V, 4 specimens (Karavaev).

21. *Aphodius (Chilothorax) clausula*
W. Koshantschikov, 1910 (Figs. 98–100)

= *A. gussakovskii* Semenov et Medvedev, 1929,
syn. n.

Diagnosis. The species can be distinguished from other representatives of the subgenus *Chilothorax* from the territory in question by the granulate, glabrous head, and from most of species also by the smaller size.

Distribution. Described from Repetek (Kara Kum Desert). Occurs in Turkmenistan, Kazakhstan, and Uzbekistan. According to Nikolajev (1987), the species is also distributed in Southern Tajikistan ("Tigrovaya Balka" Reserve).

Material. Lectotype ♂ (designated here) labeled "Repetek, sr. az. d." [in Russian], "*Volinus clausula mihi*" and "*A. clausula* m. det. W. Koshantschikov;" paralectotype ♂ with the same data.

A. gussakovskii: holotype ♀ labeled "Khiva, K. Dash'yag, 4.IV.1927, V. Gussakovskii" [in Russian] and "*Aph. (Mendidius) gussakovskii* nov. Typ. un. A. Semenov-Tian-Shansky & Medv. det. V.29."

Turkmenistan. Repetek, 9.V.1993, 1 specimen (A. Tishechkin); 3.III–2.V.1982, 5 specimens (V. Kri-vokhatskiy); 3.V.1914, 1 specimen (N. Plavilstshikov); 27.IV.1913, 5 specimens; Chardzhou, 19.VI.1905, 3 specimens (E. Fischer). Uzbekistan. Ayakagyta, 21.IV.1965, 1 specimen. Kazakhstan. Baimahan, 16.V.1995, 3 specimens (S. Ovchinnikov); Chelkar, 28–30.IV.1986, 2 specimens (G. Nikolajev); Baigakum, III.1912, 2 specimens (Koshantschikov).

22. *Aphodius (Chilothorax) zaissanicus* Nikolajev,
1987 (Figs. 25, 105, 106)

Diagnosis. The species is the most similar to *A. comma* and can be distinguished from it by brown disc of pronotum, outcurved spur of fore tibia, and the shape of the aedeagus.

Material. Holotype (♂) labeled "Zaisan 10 km. S. Kaznakovki, 18.05.1980, Nikolajev" [in Russian] and "*Aphodius zaissanicus* Nikolajev det. ." So far known only from the type specimen.

23. *Aphodius (Chilothorax) varicolor*
D. Koshantschikov, 1894 (Figs. 27, 78, 79)

Diagnosis. This species is similar to *A. xanthellus* sp. n. and *A. hieroglyphicus* Klug and can be distinguished from them by the longer and more slender fore tibial teeth, denser and longer setae on margin of genae, pronotum and shoulders, denser and longer setae on elytra, angulate genae, less contrasting and often indistinct elytral pattern, and from the first species also by the larger body.

Re-description. Male. Head pale brown, shiny, nontuberculate. Clypeus sinuate in the middle, rounded at sides. Genae acute-angled. Width of eye in dorsal view approximately twice the minimum interval between eye margin and gula. Pronotum pale brown, shiny, irregularly and sparsely punctate. Disc slightly darker. Sides and base finely bordered. Posterior angles obtuse. Lateral margins with long dense setae. Scutellum pale brown, shiny, punctate. Elytra yel-

lowish brown, shiny, with small brown maculae on intervals 3–7; maculae only slightly darker than background. Striae fine, diameter of punctures equal to width of stria. Elytral intervals finely punctate, nearly flat. Sides and apices of elytra with relatively long and dense setae. Body ventrally and legs pale brown. Disc of metasternum with sparse setae. Fore tibia with relatively long, slender teeth and acute, slightly downwards-curved spur. Apical spurs of middle tibia slender and long, lower spur longer than 1/2 of upper spur. First segment of hind tarsus slightly longer than upper apical spur of tibia and slightly shorter than three subsequent segments combined. Apical setae of hind tibia relatively short and equal in length, except for several outermost ones. Parameres without long processes (Fig. 79).

Female can be distinguished from male by narrower, more densely, irregularly punctate pronotum, shorter and sparser setae on elytra, and glabrous disc of metasternum.

Body length 5.0–6.0 mm.

Distribution. Described from environs of Urda (Uralsk Prov., Kazakhstan).

Material. Lectotype (designated here): ♂ labeled “Astrachan, Chansk[aya Stavka (Urda)]” and “*Aphodius variicolor*,” paralectotypes, 3 ♂ with the same data.

Kazakhstan. Dzhanibek, VIII.1993, 4 specimens (RCCP); Malye Barsuki Desert, 16.VI.1908, 2 specimens, and 25.VI.1910, 1 specimen.

24. *Aphodius (Chilothorax) xanthellus* Frolov, sp. n.
(Figs. 8, 28, 80–82)

Diagnosis. The species is similar to *A. variicolor*, and was probably confused with it in previous studies. It differs from *A. variicolor* in the shorter fore tibial teeth; sparser setae on genae, sides of pronotum, and shoulders; rounded genae; sparser and shorter setae on elytra; more contrasting elytral pattern; smaller average size; and shape of parameres.

Description. Holotype ♂. Head pale brown, shiny, nontuberculate. Clypeus weakly sinuate in the middle, rounded at sides. Genae small, rounded. Width of eye in dorsal view approximately twice the minimum interval between eye margin and gula. Pronotum light brown with yellowish sides, shiny, irregularly and sparsely punctate. Sides and base finely bordered. Posterior angles rounded. Lateral margins with short

sparse setae. Scutellum pale brown, shiny, punctate. Elytra yellowish brown, shiny, with brown maculae on intervals 3–7. Striae fine, punctate (diameter of punctures equal to width of stria). Intervals weakly convex, finely punctate. Sides and apices of elytra pubescent. Body ventrally and legs pale brown. Disc of metasternum with sparse setae. Apical spur of fore tibia acute and slightly curved downwards. Apical spurs of middle tibia slender and long, lower spur longer than 1/2 of upper spur. First segment of hind tarsus as long as upper apical spur of tibia and as long as three subsequent segments combined. Apical setae of hind tibia of equal length, except for several outermost ones. Parameres with small weakly sclerotized processes (Fig. 82). Body length 4.9 mm.

Female can be distinguished from male by narrower, more densely punctate pronotum, shorter and sparser setae on elytra, and glabrous disc of metasternum.

Body length of paratypes 4.0–5.2 mm.

Material. Holotype: ♂, “Kazakhstan, Malai-Sary, 24.III.1983, G. Nikolajev” [in Russian]; paratypes: 14 specimens (8 ♂ and 6 ♀) with the same data; 1 ♀, “Semirech’e, Ili River” [in Russian] and “*Scuticollis Sem.*,” 1 ♂, “Mujunkum, III–7, E. Fischer,” “*Aphodius melanostictus*” and “k. [collection] E. Fischer” [in Russian]; 1 ♂, “W. Mujunkum, Akmolinsk, A. Kricheldorff;” 9 ♂, “Kazakhstan, Kushukzhal Sands, 30 km SW of Lepsy station, G. Medvedev, 22.VI.1962” [in Russian]; 4 ♂ and ♀, “Kazakhstan, Ili River valley, sands near Tasmurun Pass, 7.V.1985, G. Nikolajev” [in Russian]; 3 ♂ and ♀, “Semirechensk Prov., Kangoi, 17–18.V.1909, Shnitnikov”.

25. *Aphodius (Chilothorax) balachanicola* Balthasar,
1973 (Figs. 76, 77)

Diagnosis. The species is closely related to *A. variicolor*, *A. xanthellus* sp. n. and *A. hieroglyphicus* Klug and can be distinguished from them by the shape of the parameres.

Re-description. Male. Head light brown, nontuberculate, shiny, densely punctate (punctures separated by 2 puncture diameters). Clypeus weakly sinuate in the middle, rounded at sides. Genae obtuse. Width of eye in dorsal view approximately twice the minimum interval between eye margin and gula. Pronotum pale brown on disc, yellowish on sides, shiny, densely punctate (punctures separated by 1–2 their diameters). Sides and base of pronotum finely bor-

dered, posterior angles obtuse. Lateral margins with sparse yellowish setae. Scutellum triangular, pale brown, shiny, punctate. Elytra straw-yellow, shiny, with small light brown maculae on intervals 3–7. Striae fine, punctate (diameter of punctures slightly greater than width of stria). Interstices slightly convex, finely punctate. Sides and apices of elytra with relatively long and dense setae. Body ventrally and legs pale brown. Disc of metasternum with dense setae. Apical spur of fore tibia acute and slightly curved downwards. Apical spurs of middle and hind tibiae slender and long, lower spur longer than 1/2 of upper spur. First segment of hind tarsus as long as upper apical spur of tibia and as long as 3 subsequent segments combined. Apical setae of hind tibia relatively short and nearly equal in length, except for several outermost ones. Parameres with long weakly sclerotized processes (Fig. 77). Body length 5.7–6.2 mm.

Female unknown.

Distribution. The species is known only from the type locality: Turkmenistan, Bolshoi Balkhan Mts., Dzhebel.

Material. Holotype and paratype labeled: “Gr. Balachan, Dschebell, F. Hauser 1989,” “*A. (Aphodaulacus) balachanicola* Balth. Holotypus [Paratypus]” (NMPC).

26. *Aphodius (Chilothorax) mongolaltaicus*
Nikolajev, 1984 (Figs. 10, 26, 83, 84)

Diagnosis. The species differs from most of representatives of the subgenus *Chilothorax* from the territory under study in the relatively large eyes, and from species with large eyes (*A. variicolor*, *A. xanthellus* sp. n., *A. balachanicola*) in the appearance, shape of fore tibia in ♂ and shape of the parameres.

Distribution. Mongolia, southwestern Siberia (Altai Mts.).

Material. Russia. Altai Mts., Yustyd Range, 3.VII.1907, 1 specimen (E. G. Rodd).

27. *Aphodius (Chilothorax) flavimargo* Reitter, 1901
(Figs. 107–109)

Diagnosis. The species is similar to *A. comma* and *A. badenkoi* and can be distinguished from them by the presence of a dark macula on the base of elytral interval 8 and by the shape of the parameres.

Distribution. Uzbekistan, Kazakhstan, Turkmenistan.

Material. Turkmenistan. Iolotan, 21.III.1927, 15 specimens (Kizeritsky). Uzbekistan. Babatag Range, Akmechet, 21.IV.1995, 1 specimen (A. Frolov); Samarkand, 11.V.1904, 1 specimen (G. Suvorov). Kazakhstan. 40 km W of Chu City, 27.III.1982, 2 specimens (G. Nikolajev); Muyunkum Desert, IV.1910, 1 specimen (E. Fischer); Panfilov, 1 specimen.

28. *Aphodius (Chilothorax) badenkoi* Nikolajev,
1987 (Figs. 110, 111)

Diagnosis. The species is similar to *A. comma* and *A. flavimargo* and can be distinguished from them by the immaculate elytra and shape of parameres.

Distribution. Kazakhstan, Uzbekistan, Turkmenistan.

Material. Paratypes: 3 ♂ and 2 ♀, “S. Z. Kazakhstan, near Chelkar, 28.04.1986, Nikolajev, Badenko” [in Russian].

Uzbekistan, Dzhar-Kurgan, 14.IV.1994, 15 specimens (S. Ovchinnikov). Turkmenistan, Ashkhabad, 29.III.1952, 3 specimens. Kazakhstan, Betpak-Dala, 17.V.1903, 3 specimens (G. Jacobson).

29. *Aphodius (Chilothorax) figuratus* A. Schmidt,
1906 (Figs. 112–114)

Diagnosis. The species differs from other representatives of the *Chilothorax* in the region considered in the completely dark sutural interval, elytral pattern, and shape of aedeagus.

Distribution. Kirghizstan.

Material. Kirghizstan. Moldotoo Range, 16.VI.1995, 6 specimens (S. Ovchinnikov); Zaalai Range, Berk-Sun River, 7.VI.1995, 3 specimens (A. Koval’); Alai Range, 8.VI.1965, 3 specimens.

30. *Aphodius (Chilothorax) hahni* Reitter, 1907
(Figs. 18, 65–67)

Diagnosis. The species can be distinguished from other representatives of *Chilothorax* in the region in question (except for *A. flammulatus*) by reddish color of body and elytra and hooked spur of fore tibia in ♂. From *A. flammulatus* it differs in the shape of the aedeagus and, in most of individuals, in elytral pattern.

Distribution. Western and northern Kazakhstan. Described from environs of Uralsk.

Material. Four ?syntypes (♀) labeled “Uralsk, Reitter” with a piece of yellow foil.

Kazakhstan. Uralsk, 7.X.1912, 90 specimens; Kurgal'dzhin, 7.V.1957, 7 specimens (L. Arnoldi); Kokchetav, 12.V.1965, 3 specimens (Ibraev); Shortandy, 11.V.1956, 1 specimen (K. Slivkina).

31. *Aphodius (Chilothorax) sticticus* (Panzer, 1798)
(Figs. 7, 57, 58)

= *A. equestris* (Panzer, 1798).

Diagnosis. The species can be distinguished from other representatives of the subgenus *Chilothorax* by the presence of pale maculae on anterior angles of clypeus and by the darkened elytral striae.

Distribution. Europe, Transcaucasus, Asia Minor.

Material. Russia. Sverdlovsk Prov., Irgizly, 11.VI.1899, 6 specimens (Jacobson, Schmidt); Moscow Prov., Klin, 7.V.1903, 12 specimens (D. Smirnov); Penza, 6.V.1918, 6 specimens (G. Olsufiev). Belarus. Minsk Prov., Rudensk, 3.V.1992, 25 specimens (A. Frolov); Brest Prov., Kamenyuki, 27.IV.1994, 20 specimens (A. Frolov). Ukraine. The Crimea, Yalta, 27.V.1911, 1 specimen (V. Pliginskiy). Georgia. Tbilisi, 22.XII.1927, 2 specimens (Kirshenblat); Kuttaisi, 15.VI.1957, 4 specimens (Kurnakov); Tsumuri, 4.V.1980, 2 specimens (K. Zagulyaev).

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