

A Review of the *Chrysolina lineella* Species-group of the Subgenus *Anopachys* Motschulsky, 1860, Genus *Chrysolina* Motschulsky, 1860 (Coleoptera, Chrysomelidae, Chrysomelinae)

A. O. Bieńkowski

Institute of Ecology and Evolution, Russian Academy of Sciences, Moscow

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Abstract—The *Chrysolina lineella* species-group of the subgenus *Anopachys* Motschulsky, 1860 is revised. *Chrysolina watanabei* Takizawa, 1970 is revalidated from the synonymy with *Ch. lineigera* (Jacobson, 1901). *Ch. sundukovi* Mikhailov, 2006 is a new junior synonym of *Ch. watanabei*. Special attention is paid to the infraspecific variability of the male and female genitalia. The structure of the aedeagal flagellum and the spermatheca are used as diagnostic characters. A key to species is included. *Ch. watanabei* is for the first time recorded from the Asian continent (Primorskii Territory of Russia and Northeastern China).

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Species of the *Chrysolina lineella* group are typical representatives of the fauna of Eastern Siberia and the Far East (according to the International Code of Zoological Nomenclature, 2000, article 6.2, the intercalary name of the group is based on the name of the first described species, *Ch. lineella* Weise). Most of them (five) are distributed in the mountain areas of Khabarovsk and Primorskii territories, two species, in Amur Province, one, in Transbaikalia, one, in north-eastern China, and one, in Japan. In appearance, species of this group are similar to the common species *Ch. (Anopachys) aurichalcea* (Gebler in Mannerheim, 1825), which can occur in the same habitats, but differ from it in the rudimentary wings and the shape of the aedeagus (without anchor-shaped widening at the apex). Species of the *Ch. lineella* group are very similar outwardly, but clearly differ from one another in the shape of the pronotum and depth and punctuation of its lateral depressions. Earlier it was suggested to differentiate the species using the shape of the aedeagus and the spermatheca (Bieńkowski, 1998).

Examination of a new material, including the type specimens, revealed inaccuracies in treating some taxa of this group. In addition, the shape of the aedeagal apex was found to vary significantly within a species. A similar variability occurs in various subgenera of the genus *Chrysolina*, e.g., in *Ch. (Apterosoma) angusticollis*, *Ch. (Apterosoma) aino*, *Ch. (Chalcoidea) pusa*, *Ch. (Chalcoidea) lopatini*, *Ch. (Anopachys) aurichal-*

cea, *Ch. (Anopachys) quadrangulata*, *Ch. (Arctolina) tundralis*, *Ch. (Colaphoptera) purpurascens* (Hasegawa, 1980; Voronova, 1985; Bieńkowski, 1998, 2004a; Kippenberg, 2004).

At the same time, examination of the internal structure of the aedeagus, namely its flagellum (a sclerotized element of the endophallus) allowed me to find new characters for distinguishing species of the *Ch. lineella* group. The internal structure of the aedeagus, including the shape of the flagellum, is used for differentiation of closely related species in various groups of leaf beetles, e.g., *Chrysolina quadrigemina* (Suffrian, 1851) and *Ch. anatolica* (Dahlgren, 1984), *Oulema melanopus* (Linnaeus, 1758) and *O. duftschmidi* (Redtenbacher, 1874), *Cryptocephalus flavipes* Fabricius, 1781 and *C. bameuli* Duhaldeborde, 1999 (Dahlgren, 1984; Bieńkowski, 2004b). The diagnostics of species of the considered group, based on comparative analysis of the external and internal morphology of the aedeagus and spermatheca, is the subject of the present study.

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Part of paratypes of *Ch. neglecta* are deposited in the author's collection (Zelenograd, Moscow, BC).

Chrysolina lineella Group
of the Subgenus *Anopachys*

Diagnosis. Dorsal side strongly shining, metallic, one-color or with narrow stripes of different colors on elytra (Fig. 12); ultimate segment of maxillary palp oval, obtused at apex, similar in size to penultimate one, identical in both sexes; pronotum along entire length with convex lateral carinae (Figs. 6, 12, 17) basally separated from disc by moderately deep or rather shallow depressions (shallow and almost obliterate at apex) entirely covered with large punctures; propleura convex, with depression covered with transverse wrinkles along outer margin; elytra without humeral calli, densely and confusingly punctate, without longitudinal carinae, but frequently with 4 or 5 narrow smooth longitudinal stripes against background of confused punctation, these stripes bounded by more or less regular rows of punctures (Fig. 12); elytral epipleura inclined, visible in lateral view along entire length, with sparse or dense setae at apex; wings rudimentary; pygidium with longitudinal groove along entire length or at least in basal half; apical abdominal sternite of male more or less convex, mostly with weak depression in apical half, that of female convex and attenuate downward at apex, but without narrow protruding process compressed at sides; 1st–3rd tarsal segments with entire hairy sole surface in both sexes, moderately widened in male. Aedeagus long and fine, oval (Figs. 1–5, 9–11, 13, 16, 18–21) or flattened (Figs. 14, 15) in cross-section, regularly bent dorsoventrally, rounded at apex, obtused or bearing short process; flagellum long and fine, projecting in repose position slightly beyond limits of apical opening.

Note. In addition to species of the *Ch. lineella* group, the subgenus *Anopachys* of the genus *Chrysolina* also includes two apterous species. One of them, *Ch. koreana* Chûjô, 1941 described from the Korean Peninsula, differs from representatives of the *Ch. lineella* group in the nearly entire absence of lateral depressions of the pronotum and in the shape of

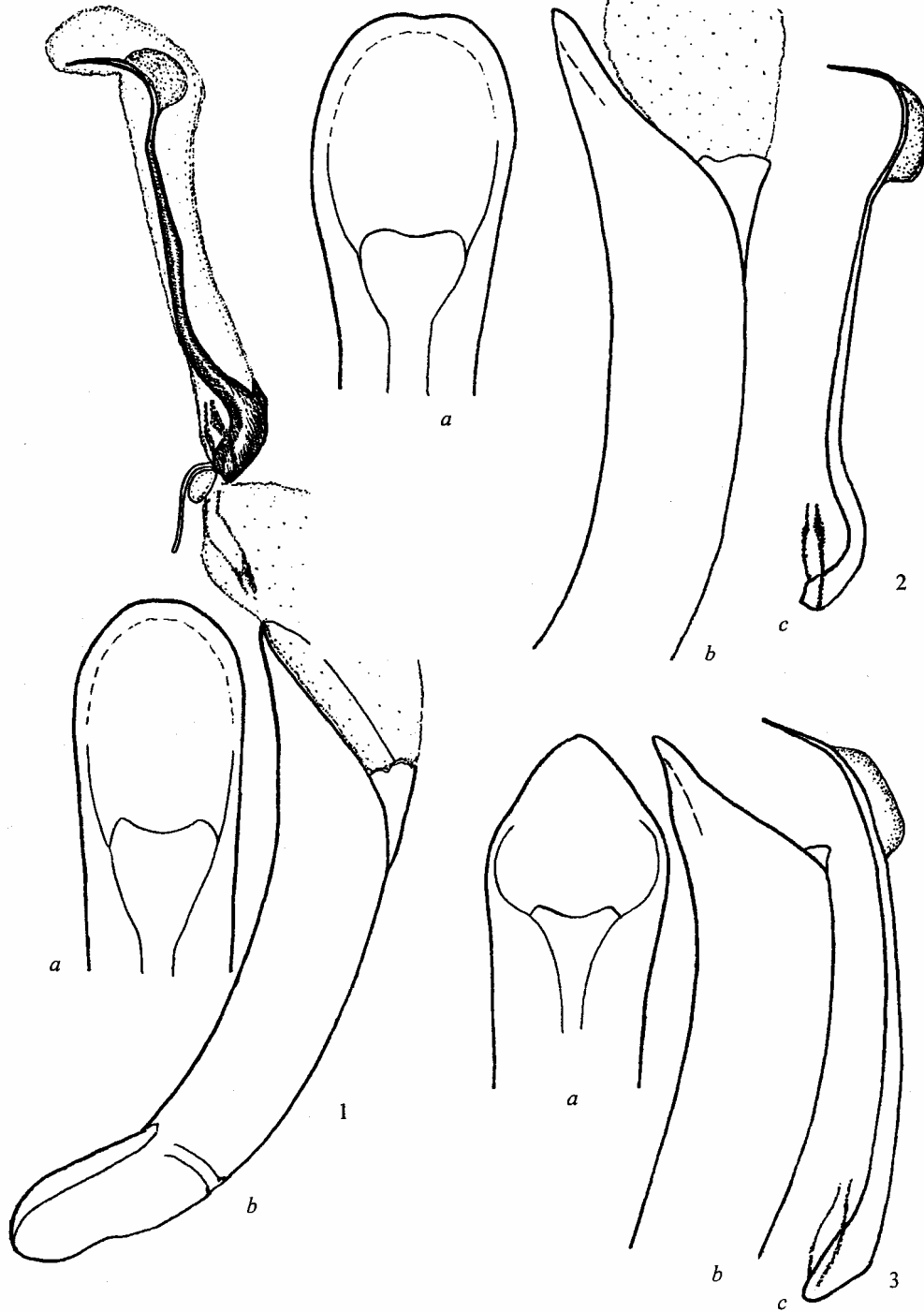
the apical abdominal sternite of the male (with a wide and deep depression at the apex and the bisinuate apical margin). The second species, *Ch. stalii* (Baly, 1862) known only from the type specimen (female) from northeastern China, differs from representatives of the considered group in the shape of the pygidium (without longitudinal depression) and in the absolutely smooth, impunctate pronotal disc. However, this species cannot be accurately characterized because of the absence of males in collections.

Chrysolina lineella (Weise, 1887)

Chrysolina aurichalcea var. *lineella* Weise, 1887 : 182 (“Amur”).

Description. Body oval or obovoid. Pronotum shagreened (occasionally smooth at sides), elytra shagreened. Coloration of dorsal side varying: (1) head and pronotum dark bronze or violet, elytra copper with golden-green suture and 4 longitudinal stripes; (2) dorsal side golden-green, with green stripes on elytra; (3) dorsal side black, with metallic tint and dark copper stripes on elytra; (4) head and pronotum black, elytra violet; ventral side and legs black, with metallic tint; antennae dark brown, with rufous apices of 1st–5th (occasionally also 6th) segments. Distance from base of antennae to clypeus 1.4–1.5 times that to eye. Pronotum 1.8–2.3 times as wide as long along median line ($n = 8$), widest before middle, with sides arcuate at apex and nearly straight at base, or widest at base; disc irregularly covered with small or rather large punctures; lateral depressions varying from shallow and obliterate to deep in basal 1/3–1/2 and from shallow to absolutely obliterate at apex, covered with abundant large punctures partly extending from lateral depressions toward disc. Pygidium with longitudinal groove gradually narrowed toward apex and nearly reaching it. Aedeagus (Figs. 1–3) weakly widened at sides of apical opening, usually rounded, occasionally obtused or triangularly pointed apically, and obliquely truncate in lateral view; flagellum gradually narrowed from base to apex, hooked apically, without flat lateral lobes but with weakly sclerotized pale brown pillow-shaped appendage before apex on dorsal side. Spermatheca (Figs. 30–33) arcuate, without distinct constriction at base, with small prominence at apex. Body length 7.2–7.6 mm in male, 6.8–8.7 mm in female.

Material. Paralectotype with labels: “Amur Koltze,” “*lineella* m.,” “Typus” [red], “Paralectotype *Chrysolina aurichalcea* var. *lineella* Weise, 1887.”

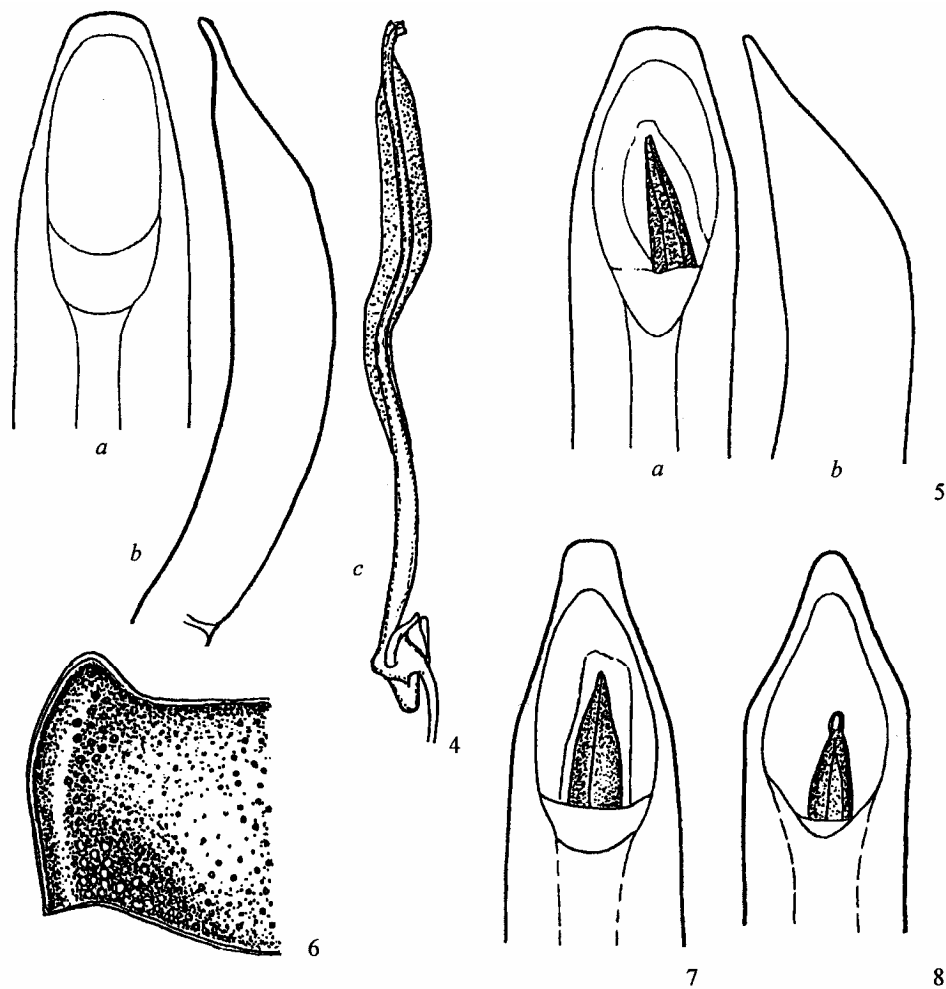


Figs. 1–3. *Chrysolina lineella* (Weise), variability of genitalia [(a, b) aedeagus, dorsal and lateral view, respectively; (c) flagellum], Primorskii Terr.: (1) Yakovlevka Vill., (2) Krivoi Klyuch Vill., (3) Anisimovka Vill.

design. Bieńkowski, 1993,” “*Chrysolina lineella* (Wse.), A. Bieńkowski det., 1993,” ♀ (ZIN).

Additional material. Amur Prov.: 40 km W of Svobodnyi, thickets of *Corylus*, 5.VI.1958 (Zinoviev), 1 ♀; “Chabarofka,” 4 ♂. Khabarovsk Terr.: Khekhtsir Mt. Range, 5.X.1956 (O.N. Kabakov), 1 ♀. Primorskii

Terr.: Krivoi Klyuch Vill., 27.VI.1937 (Stepanov, N.N. Shutova), 1 ♂, 1 ♀; Yakovlevka Vill., 1927 (Kvashuk), 1 ♂; Shkotovo Vill., 7.VI.1927 (Sokolov), 1 ♂; Khualaza Mt., 1200 m, 26.VIII.1974 (A.Yu. Berzantsev), 1 ♀; Spasskoe Vill., 6.X.1911 (A. Cherskii), 1 ♀; Khasanskii Distr., Barabash Vill.,



Figs. 4–8. *Chrysolina lineigera* (Jacobson): (6) pronotum; (4, 5, 7, 8) variability of genitalia [(a, b) aedeagus, dorsal and lateral view; (c) flagellum]; (4) Primorskii Territory, Sikhote Alin, Tardoki-Yani Mt. Range; (5, 6) lectotype, Chita Prov., Gornyi Zerentui Vill.; (7) Primorskii Terr., Sikhote Alin, Tardoki-Yani Mt. Range; (8) Amur Prov., Myao-Chan Mt. Range.

18.VIII.1980 (P. Kostin), 1 ♀; environs of Ussuriisk, Kamenushka Vill., 20.VI.1980 (N.B. Nikitsky, V.V. Belov), 1 ♂; Shkotovskii District, Anisimovka Vill., 23.VII.1988, 1 ♂.

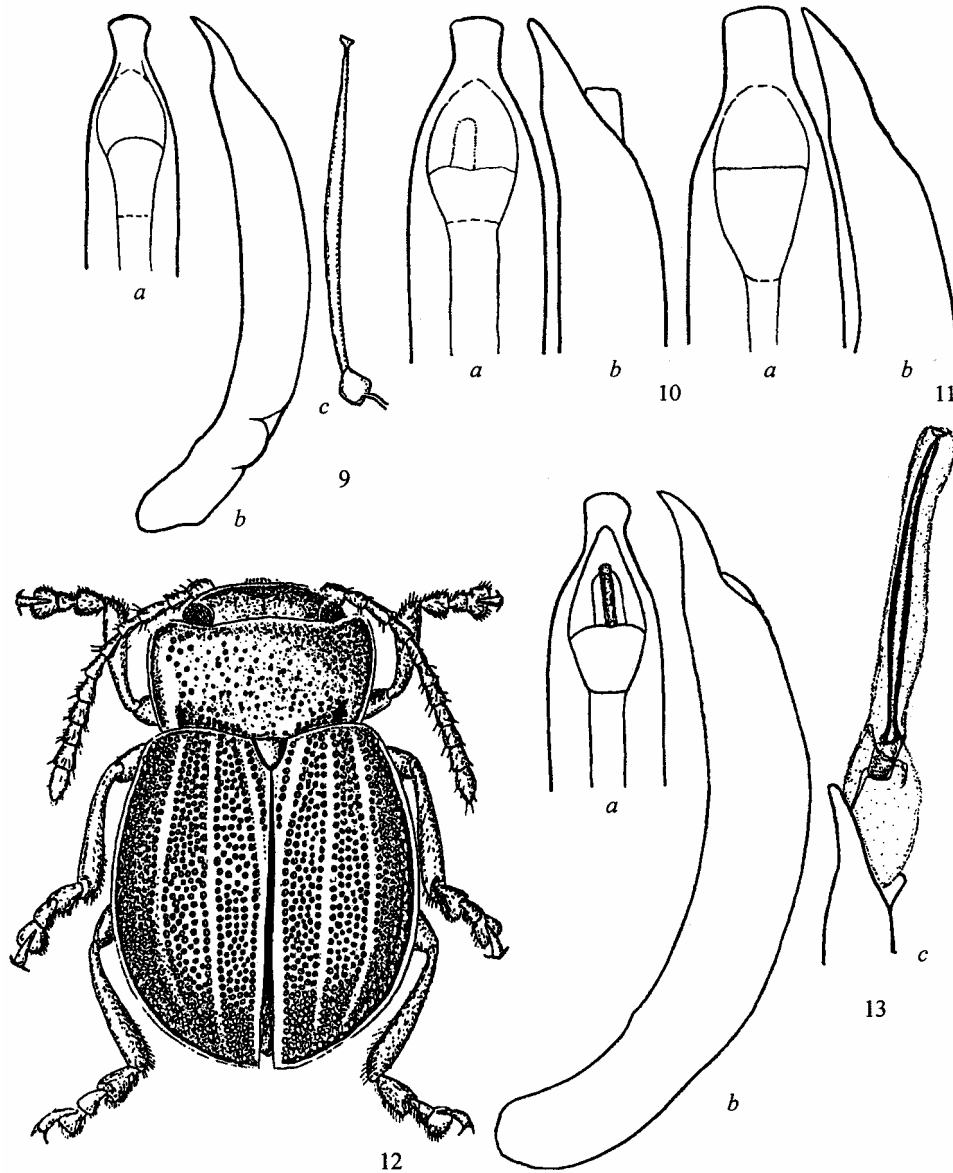
Distribution. Far East: Amur Prov., Khabarovsk and Primorskii territories.

Chrysolina lineigera (Jacobson, 1901)

Chrysolina lineigera Jacobson, 1901 : 127, nomen substitutes pro *Chrysolina angusticollis*: Jacobson, 1893 : 125 (Chita reg.: Gornyj Serentuj), non *Apterosoma angusticollis* Motschulsky, 1860 : 23.

Description. Body oval or obovoid. Pronotum and elytra shagreened or smooth. Coloration of dorsal side varying: (1) head dark bronze, pronotum golden, elytra green; (2) dorsal side bronze, with golden or green stripes on elytra; (3) dorsal side dark violet; (4) head

and pronotum bronze or violet, elytra copper with 5 golden stripes; (5) head and pronotum black, elytra violet; (6) dorsal side copper, with golden or purple shine; (7) dorsal side reddish purple; (8) dorsal side blue, ventral side and legs black with metallic tint, antennae blackish or brown, 1st antennal segment ventrally, and some others apically rufous. Base of antenna 1.4–2.0 times closer to clypeus than to eye. Pronotum (Fig. 6) 1.9–2.1 times as wide as long along median line ($n = 10$), widest near middle, with sides arcuate at apex and nearly straight or shallowly emarginate at base; disc irregularly covered with more or less large, dense or sparse punctures; lateral depressions from small to wide and deep in basal half and from moderately deep to absolutely obliterate at apices, covered with numerous large punctures partly extending from lateral depressions toward disc. Pygidium along entire length (occasionally only in basal



Figs. 9–13. *Chrysolina neglecta* Bieńkowski: (9–11, 13) variability of genitalia [(a, b) aedeagus, dorsal and lateral view; (c) flagellum]; (12) total view, holotype, Khabarovsk Terr., Khekhtsir Mt. Range [(9) environs of Khabarovsk; (10) paratype, Vladivostok; (11) paratype, Khabarovsk Terr., Khekhtsir Mt. Range; (13) aedeagus, holotype, Khabarovsk Terr., Khekhtsir Mt. Range].

1/2–2/3) with longitudinal groove gradually narrowed toward apex. Aedeagus (Figs. 4, 5, 7, 8) narrowed at sides of apical opening, widely obtused or attenuate apically; apical opening covered with membrane only in basal 1/8–1/4; flagellum straight near apex, with sclerotized lateral lobes. Spermatheca (Figs. 22–25) hook-shaped, without constriction at base, rounded at apex. Body length 6.1–7.3 mm in male, 6.6–7.7 mm in female.

Material. Lectotype with labels: “Gorn. Serent.,” “Lectotype *Chrysolina lineigera* Jacobson, 1901, design. Bieńkowski, 1993” [red], “*Chrysolina lineig-*

era (Jac.) A. Bieńkowski det., 1993,” ♂ (ZIN); paralectotypes: “Gorn. Serent.,” 4 ♀ (ZIN).

Additional material. Amur Prov.: “Amur” (Yankovskii), 2 ♀; Amur Prov. (?), Myao-Chan Mt. Range, Amut River, 21.VIII.1982 (O.N. Kabakov), 1 ♂. Khabarovsk Terr.: 150 km N of Komsomolsk, Kharpichkan River, 15.X.1957 (O.N. Kabakov), 1 ♀; Bychikha Vill., 25.VIII.1990 (J. Bradka), 1 ♂; Sikhote Alin, Mt. Tardoki-Yani, 1900 m, mountain tundra, 28.VI.1980 (Lafer), 1 ♀; same locality, 1350 m, meadow, 30.VI.1980 (Lafer), 1 ♂; same locality, 1400 m, 18.VI.1980 (Lafer), 1 ♀; same locality, 1730 m, moun-

tain tundra, 21.VI.1980 (Plutenko), 1 ♂; Khekhtsir Mt. Range, IX.1930 (Prinada), 1 ♀; same locality, 21.IV.1976 (Pototskaya), 1 ♀. Primorskii Terr.: Vinogradovka Vill., 17.V.1929 (Kiritshenko), 1 ♀; "Kedrovaya Pad" Nature Reserve, 3.V.1969, 1 ♀; Sidemi Vill., 14.VIII.1926 (Ivanov), 1 ♀; same locality, 1897 (Yankovskii), 1 ♀; Cheremukhovaya River, 15 km upstream of Cheremshan Vill., Kamennyi Klyuch Vill., 7.VIII.1986 (Zherikhin, Grachev), 1 ♂.

Distribution. Siberia: Chita Prov.; Far East: Amur Prov., Khabarovsk and Primorskii territories.

Note. A key to Siberian species of the subgenus *Anopachys* (Mikhailov and Atuchin, 2006) contains no mention of *Ch. lineigera*, though this species has been first recorded from Chita Prov. (Jacobson, 1893, 1901) in the territory of Siberia.

Chrysolina neglecta Bieńkowski, 1998

Chrysolina (Anopachys) neglecta Bieńkowski, 1998 : 133 ("Khabarovsk Terr.: Khekhtsir ridge").

Description. Body oval (Fig. 12). Pronotum shagreened (occasionally with smooth lateral carinae), elytra smooth. Dorsal side slightly varying in coloration, but smooth stripes on elytra not differing in color from background: (1) dorsal side blackish violet, pronotum with bluish tint; (2) head blackish blue, pronotum and elytra blackish violet; (3) head blue, pronotum and elytra dark golden-green; (4) dorsal side dark bronze; ventral side black, with metallic tint; legs black, with blue or violet tint, bases of trochanters rufous; antennae dark brown, 1st segment ventrally and 2nd apically rufous or both entirely rufous. Base of antenna equally distant from inner margin of eye and from clypeus or no more than 1.2 times closer to clypeus than to eye. Pronotum (Fig. 12) 1.8–2.0 times as wide as long along median line ($n = 5$), widest before middle, with lateral sides arcuate at apex and nearly straight at base; disc irregularly covered with small or rather large punctures; lateral depressions shallow and small at base and obliterate at apex, covered with few large punctures. Pygidium with deep or shallow longitudinal groove along entire length or in basal 2/3, gradually narrowed toward apex and nearly reaching it. Aedeagus (Figs. 9–11, 13) roundly narrowed at sides of apical opening, with narrow apical prominence constricted basally; apical opening covered with membrane in basal 1/2; flagellum straight near apex, without lateral lobes, widest in middle. Spermatheca (Figs. 26–29) hook-shaped, constricted at

base, pointed at apex. Body length 5.2–6.3 mm in male, 6.1–7.0 mm in female.

Material. Holotype: Khabarovsk Terr., Khekhtsir Mt. Range, 21.IV.1976 (Pototskaya), ♂ (ZIN). Paratypes: Khekhtsir Mt. Range, 20.IX–6.X.1956 (O.N. Kabakov), 3 ♀ (BC, KC); same locality, cedar-broadleaved forest, 1973, 1 ♂ (BC); same locality, 19.VIII.1972, 1 ♀ (BC); same locality, 21.IV.1976 (Pototskaya), 1 ♀ (ZIN). Primorskii Terr.: Vladivostok, IX.1876 (Christoff), 1 ♂ (ZIN); same locality, 8.VI.1929 (Shabliovskiy), 1 ♀ (ZIN); Suchan [Partizansk], Khlystovka River valley, 22.IV.1932, 1 ♀ (ZIN); Suputinka Vill., 22.V–2.VI.1973 (Kral), 1 ♂ (LC).

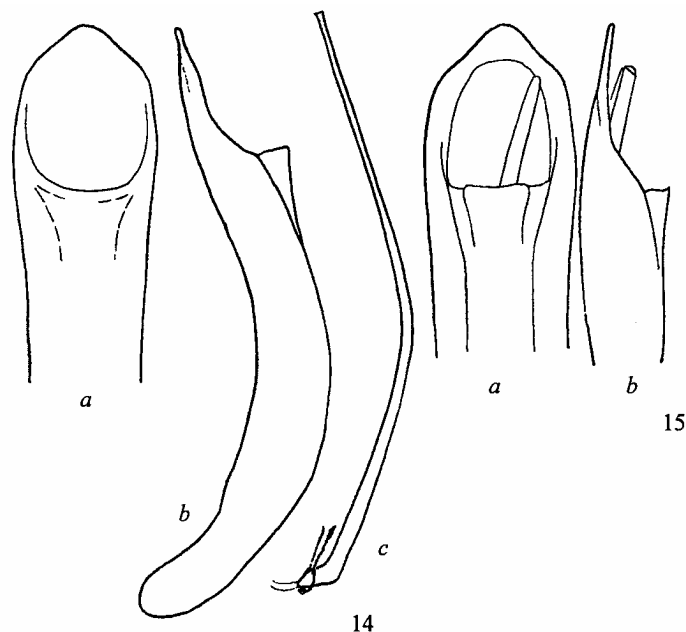
Additional material. Khabarovsk Terr.: S Khabarovsk, Korfovskaya Vill., 20.IX.1956 (O.N. Kabakov), 1 ♂; same locality, 1.X.1956 (O.N. Kabakov), 4 ♂. Primorskii Terr.: Suputinka Vill., 22.V–2.VI.1973 (Kral), 1 ♂; S Primorskii Territory, Tummin River, VII.1909 (V.K. Arseniev), 1 ♂.

Distribution. Far East: Khabarovsk and Primorskii territories.

Chrysolina pala Bieńkowski, 1998

Chrysolina (Anopachys) pala Bieńkowski, 1998 : 135 ("Primorski krai: environs of lake Khanka, Troitskoye").

Description. Male (female unknown). Body oval or obovoid. Pronotum with obliterate shagreenity, elytra smooth. Head and pronotum blackish blue, elytra blackish violet, or dorsal side entirely dark bronze; ventral side and legs black, with weak metallic tint; antennae blackish brown, with 1st–7th segments rufous apically. Base of antenna 1.2–1.3 times closer to clypeus than to eye. Pronotum 1.9 times as wide as long along median line ($n = 1$), widest before middle, roundly narrowed toward base and apex, slightly emarginate laterally before base; disc irregularly densely covered with shallow and rather large punctures; lateral depressions moderately deep in basal 1/3, obliterate at apex, covered with numerous large punctures partly extending from lateral depressions toward disc. Pygidium with weak longitudinal groove along almost entire length or only in basal 2/3. Aedeagus (Figs. 14, 15) flattened dorsoventrally, weakly widened at sides of apical opening, triangularly narrowed at apex, deflected upward in lateral view. Body length 6.6–6.9 mm.



Figs. 14, 15. *Chrysolina pala* Bieńkowski, variability of genitalia, [(a, b) aedeagus, dorsal and lateral view; (c) flagellum]: (14) Khabarovsk; (15) holotype, Primorski Territory, Lake Khanka.

Material. Holotype: Primorski Territory, near Lake Khanka, Troitskoe Vill., 10.VI.1909 (Cherskii), ♂ (ZIN).

Additional material. Khabarovsk, 1 ♂.

Distribution. Far East: Khabarovsk and Primorski territories.

Chrysolina watanabei Takizawa, 1970

Chrysolina watanabei Takizawa, 1970 : 121 (“Hokkaido: Moiwa-yama, Sapporo”).

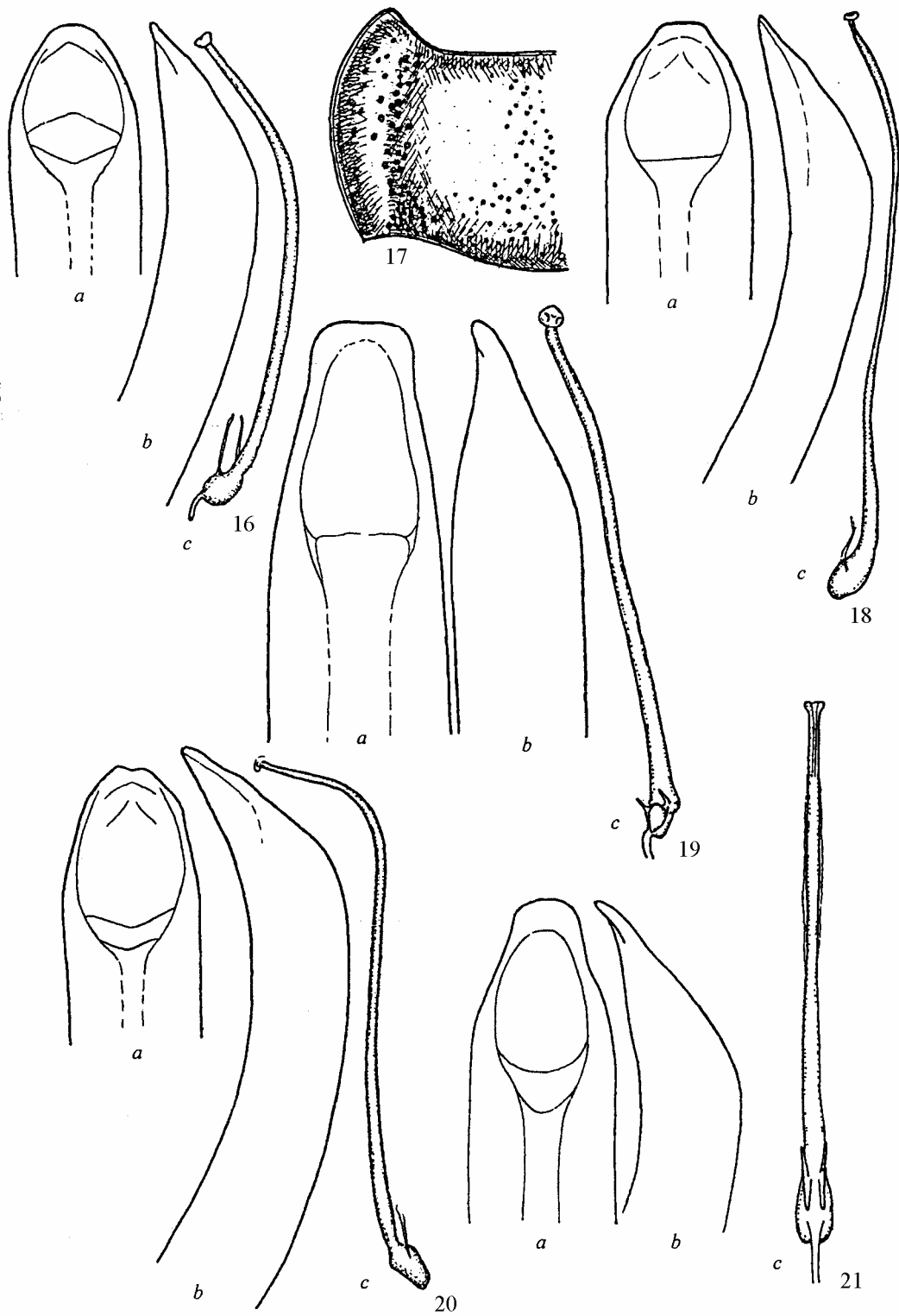
Chrysolina sundukovi Mikhailov, 2006 : 135 (“Lazovskii Nature Reserve, Korpad locality”), **syn. n.**

Description. Body obovoid. Pronotum shagreened or smooth, elytra smooth. Coloration of dorsal side varying: (1) head black with weak violet or bronze shine, pronotum black with weak bronze shine on disc and with violet shine on lateral carinae, scutellum blue, elytra copper with 5 golden stripes; (2) dorsal side entirely dark violet or with dark green pronotal disc; (3) head and pronotum bronze, elytra golden-red with 5 green stripes; ventral side and legs dark metallic; antennae dark brown, 1st and 2nd segments rufous ventrally at apices. Base of antenna situated twice closer to clypeus than to eye. Pronotum (Fig. 17) 1.8–2.2 times as wide as long along median line ($n = 11$), widest at middle, with arcuate lateral sides; disc covered with moderately large (occasionally also with

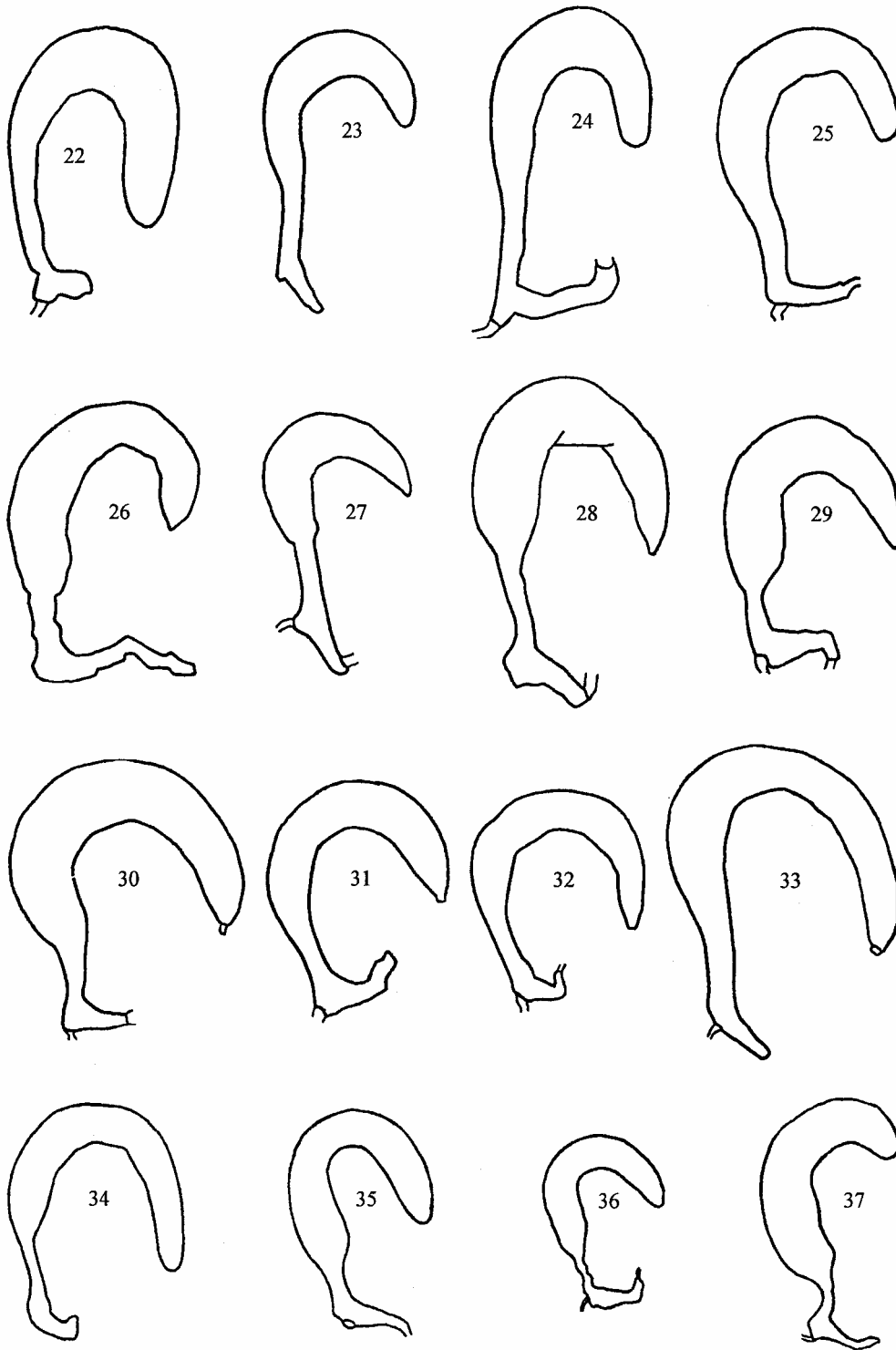
small) punctures, usually with 2 impunctate areas before middle at sides of disc; lateral depressions wide, usually deep (occasionally shallow) in basal 1/3, moderately deep at apex, covered with numerous large punctures. Pygidium with longitudinal groove gradually narrowed toward apex and not reaching it. Aedeagus (Figs. 16, 18–21) narrowed at sides of apical opening, widely obtused or attenuate at apex; apical opening covered with membrane only in basal 1/8–1/4; flagellum straight near apex, without sclerotized lateral lobes, widest at base. Spermatheca (Figs. 34–37) hook-shaped, constricted at base, rounded at apex. Body length 6.2–7.3 mm in male, 7.0–8.4 mm in female.

Material. Paratypes: Hokkaido, Sapporo, 18.VIII.1996 (H. Takizawa), 2 ♀ (TC).

Additional material. Primorski Terr.: Lazovskii Nature Reserve, 12 km S of Staraya Kamenka Vill., 10.VII.2004 (M. Smirnov, L. Smirnov), 1 ♀; same locality, 14.VII.2004 (M. Smirnov, L. Smirnov), 1 ♂, 1 ♀; same locality, 18.VII.2004 (M. Smirnov, L. Smirnov), 1 ♀; Lazovskii Distr., Kievka Vill., VIII.1979 (V. Oliger), 1 ♂; Suvorovo Vill., 19.VI.1974 (A. Ponomarenko), 1 ♂; Yakovlevka Vill., 1927 (Kvashuk), 1 ♂, 1 ♀; southern Sikhote Alin, Mt. Oblachnaya, 1700 m, zone of *Betuli ermanii* and *Pinus pumila*, 4–6.VII.2002 (Yu. Sundukov), 1 ♂, 2 ♀; Sikhote Alin, Serebrino Vill., 13.VI.1974 (Zlobin), 1 ♂,



Figs. 16–21. *Chrysolina watanabei* Takizawa: (16, 18–21) variability of genitalia [(a, b) aedeagus, dorsal and lateral view; (c) flagellum]; (17) pronotum [(16) Primorskii Territory, Lazovskii Distr., Kievka Vill.; (17) paratype, ♀, Japan, Hokkaido, Sapporo; (18) Primorskii Terr., Suvorovo Vill.; (19) Japan, Hokkaido, Sapporo; (20) Primorskii Terr., Sikhote Alin, Mt. Oblachnaya; (21) northeastern China, Vetka St.].



Figs. 22–37. Species of the *Chrysolina lineella* group, variability of spermatheca: (22–25) *Ch. lineigera* (Jacobson), (26–29) paratypes of *Ch. neglecta* Bieńkowski, (30–33) *Ch. lineella* (Weise), (34–37) *Ch. watanabei* Takizawa [(22) paralectotype, Chita Prov., Gornyi Zerentui Vill.; (23) Amur Prov.; (24, 27, 29, 32) Khabarovsk Terr., Khekhtsir Mt. Range; (25) Primorskii Terr., Sikhote Alin, Tardoki-Yani Mt. Range; (26) Primorskii Terr., Suchan [Partizansk]; (28) Primorskii Terr., Sikhote Alin; (30) Primorskii Terr., Spasskoe Vill.; (31) Primorskii Terr., Mt. Hualaza; (33) Primorskii Terr., Krivoi Klyuch Vill.; (34) Primorskii Terr., Lazovskii Nature Reserve; (35) paratype, Japan, Hokkaido, Sapporo, (36) Primorskii Terr., Sikhote Alin, Mt. Oblachnaya; (37) Primorskii Terr., Yakovlevka Vill.

1 ♀. Northeastern China: Vetka Station, 14.VI.1908 (Martenson), 1 ♂, 1 ♀. Japan: Hokkaido Island: Kurodake, Daisetsu Mts., 21.VII.1962 (Y. Miyatake), 1 ♀; Sapporo, 14.IX.1968 (Kocha), 1 ♂; Muine Mt., 26.VIII.1968 (K. Kusigemati), 1 ♀; Risiri Island near Hokkaido, 24.VIII.1981 (Kirschenhofer), 1 ♂.

Distribution. Far East: Primorskii Terr., Japan (Hokkaido), northeastern China. Takizawa (1970) also recorded this species from Sakhalin from one female. Having no material from Sakhalin at my disposal, I cannot conclude, whether this record refers to this or another species of the considered group.

Host plants. Asteraceae: *Aster glehni* [Hokkaido, after: Takizawa, (1970)].

Note. I had at my disposal specimens from Primorskii Territory and northeastern China, which belonged to the *Ch. lineella* group, but differed from all the known species. However, *Ch. watanabei* was not known to me. This species had been synonymized with *Ch. lineigera* by Medvedev (1992), and I followed this synonymy (Bieńkowski, 1998). Later, having examined a series of specimens of *Ch. watanabei* (including paratypes and topotypes) from Hokkaido Island, I revealed differences of this species from *Ch. lineigera* in the structure of the male and female genitalia and identified specimens of the unknown species as *Ch. watanabei*. Thus, I first indicate this species from the Asian continent, namely, from Primorskii Territory and northeastern China. The contour of the aedeagal apex is variable in both species, but the shape of the aedeagal flagellum and spermatheca allows their discrimination (Figs. 4–8, 16–21, 22–25, 34–37). The flagellum is narrow, tubular, weakly widened basally in *Ch. watanabei*, but bears lateral sclerotized lobes in *Ch. lineigera*. The shape of the spermatheca of *Ch. watanabei* is similar to that of *Ch. neglecta* rather than to that of *Ch. lineigera*. At the same time, *Ch. watanabei* differs from *Ch. neglecta* in size and coloration of the body, deeper and wider lateral depressions of the pronotum, in the aedeagus without narrow apical process, and in the shape of the flagellum (not widened at the middle of length) and spermatheca (rounded apically). In my previous revision of the subgenus (Bieńkowski, 1998), an error was made: the specimen shown in Fig. 57 as *Ch. lineigera* actually belongs to *Ch. watanabei*.

I have examined five topotypes of *Ch. sundukovi* (Figs. 16, 34) described from Lazovskii District of Primorskii Territory and eight additional specimens

from various localities in Primorskii Territory and came to a conclusion that *Ch. watanabei* and *Ch. sundukovi* are conspecific. The shape of the aedeagus varies in *Ch. watanabei* as well as in the other closely related species (*Ch. lineigera*, *Ch. lineella*, *Ch. neglecta*). Mikhailov (2006a) has noted that the shape of the aedeagal apex differs even between the holotype and paratype of *Ch. sundukovi*. I consider that the shape of the aedeagal apex of *Ch. sundukovi* is a variant of intraspecific variability of *Ch. watanabei*. However, the shape of the flagellum and spermatheca is constant within the limits of each species of the *Ch. lineella* group and allows discrimination of the species.

*A Key to Species of the Chrysolina lineella Group
of the Subgenus Anopachys*

- 1 (6) Aedeagus narrowed at sides of apical opening (Figs 4, 5, 7–11, 13, 16, 18–21).
- 2 (5) Aedeagus obtused or narrowly attenuate at apex, its apical opening covered with membrane only in basal 1/8–1/4 (Figs 4, 5, 7, 8, 16, 18–21). Dorsal side with various metallic tints, usually with narrow longitudinal stripes differing from background, rarely entirely dark violet. Lateral depressions in basal half of pronotum usually wide and deep (Figs. 6, 17).
- 3 (4) Flagellum of aedeagus with flat sclerotized lateral lobes (Fig. 4). Spermatheca gradually widened from base to apex and rounded apically (Figs. 22–25). Body length 6.1–7.3 mm in male, 6.6–7.7 mm in female. Chita and Amur provinces, Khabarovsk and Primorskii territories *Ch. lineigera* (Jacobson).
- 4 (3) Flagellum narrow, without lateral lobes, widest at base (Figs. 16, 18–21). Spermatheca hook-shaped, constricted in basal part, rounded at apex (Figs. 34–37). Body length 6.7–7.3 mm in male, 7.3–8.4 mm in female. Primorskii Territory, Japan (Hokkaido Island), Northeastern China *Ch. watanabei* Takizawa.
- 5 (2) Aedeagus with narrow apical prominence constricted basally, apical opening of aedeagus covered with membrane in basal half (Figs. 9–11, 13). Flagellum narrow, widest in middle (Figs. 9, 13). Spermatheca constricted in basal part, pointed at apex (Fig. 26–29). Dorsal side dark violet, rarely dark brass, never bronze or two-color. Lateral depressions at base of pronotum

narrow and shallow (Fig. 12). Body length 5.2–6.3 mm in male, 6.1–7 mm in female. Khabarovsk and Primorskii territories *Ch. neglecta* Bieńkowski.

- 6 (1) Aedeagus weakly widened at sides of apical opening (Figs. 1–3, 14, 15).
- 7 (8) Aedeagus oval in cross-section, rounded and occasionally obtused at apex (Figs. 1–3). Flagellum gradually narrowed from base to apex, with hooked end and with pillow-shaped appendage on dorsal side before apex (Figs. 1–3). Spermatheca arcuate, without distinct constriction at base, with small prominence at apex (Figs. 30–33). Body length 7.2–7.6 mm in male, 6.8–8.7 mm in female. Amur Prov., Khabarovsk and Primorskii territories *Ch. lineella* (Weise).
- 8 (7) Aedeagus flattened in cross-section, triangular at apex (Figs. 14, 15). Flagellum straight near apex (Fig. 14). Body length 6.6–6.9 mm in male, female unknown. Khabarovsk and Primorskii territories *Ch. pala* Bieńkowski.

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