

A Review of Leaf Beetles of the *Psylliodes saulcyi* Species-Group (Coleoptera, Chrysomelidae, Alticinae)

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Abstract—The *Psylliodes saulcyi* species-group is reviewed. Three new species are described: *Psylliodes infandus* sp. n. from southwestern Mongolia, *P. analogicus* sp. n. from Central Tien Shan, and *P. astenicus* sp. n. from southern Tajikistan. The taxonomic status of *P. grigorievi* Jcbs. is discussed, the lectotype of this species is designated, and redescription is given. The distribution of members of the group is considered and a key to them is provided.

The first attempt to build a classification of the large genus *Psylliodes* was made by Heikertinger (1926), who separated groups of species on the basis of external morphological characters and structure of the aedeagus. The *Psylliodes saulcyi* group included *P. saulcyi* All., *P. atriplicis* Jcbs., *P. dilutellus* Hktg., and *P. grigorievi* Jcbs. Leonardi (1970) proposed another classification of the genus. He only took into consideration the structure of the spermatheca and some details of the structure of the frontal tubercles. Leonardi included in the *P. saulcyi* group two more species, *P. cupreatus* Duft. and *P. affinis* Payk., only on the basis of a similar structure of the spermatheca, and named this group “*P. affinis*.” Furth (1983) brought *P. atriplicis* to a synonym of *P. saulcyi* and, discussing the phylogenetic relationships of the genus, indicated that *P. cupreatus* and *P. affinis* were, apparently, erroneously referred to this group. I consider that the group *P. affinis* sensu Leonardi unites unrelated species. Being similar only in the structure of the spermatheca, *P. cupreatus* and *P. affinis* differ from other members of this group in a number of important diagnostic characters: absence of 3 teeth at apex of aedeagus, shape of spiculum ventrale and styli of ovipositor, shape of body, entirely developed wings, structure and sculpture of head and pronotum, and character of pubescence. Thus, I include in this group only *P. saulcyi*, *P. dilutellus*, and *P. grigorievi*. In the present communication, three species of the group are described as new to science.

The study is based on examination of the material from the Zoological Institute, Russian Academy of Science [ZIN], and also that supplied by E. Spreher (Natural History Museum, Basel [NHMB]), A.S. Kon-

stantinov (Smithsonian Institute, Natural History Museum, Washington [USNM]), L.N. Medvedev (Institute of Ecology and Evolution, Russian Academy of Science, Moscow [LM]), P. Limbourg (Royal Institute of Natural Sciences of Belgium, Brussels [ISNB]), M. Döberl (Germany, MD), and H. Silfverberg (Zoological Museum of University of Helsinki, [MZHF]).

The holotypes and paratypes of the species described here are deposited at the Zoological Institute, Russian Academy of Science (St. Petersburg), except for cases specially indicated.

Genus *PSYLLIODES* Latreille in Berthold, 1827

P. saulcyi group

Heikertinger, 1926 : 125.

The *Psylliodes saulcyi* group is formed by mainly Asian, weakly pigmented representatives of the genus.

Description. Body elongate, obtused at anterior and posterior ends, not convex, slightly flattened. Elytra parallel-sided in middle; pronotum wide, rectangular, weakly, if at all, narrowed forwards, slightly narrower than elytra at base, with usually very widely rounded base. Antennae rather slender; apical segments weakly widened, moderately long. Frontal carina very wide, weakly convex; eyes and antennal sockets widely spaced; vertex and frons wide. Anterior margin of pronotum with row of very short erect hairs pointing forwards and frequently invisible; hairs at lateral margins longer and sparser; setae on anterior angles very long, usually reaching posterior angles; very short and sparse hairs extending onto lateral declivity of anterior margin of pronotum. Elytral epipleura more or less

densely pubescent along entire length; hairs as short as those at sides of pronotum, recumbent in basal 2/3, arranged irregularly, erect in apical 1/3, forming regular row reaching inner angle of elytra. Wings short, not reaching elytral apex. Fore tarsus in male weakly widened. Aedeagus with 3 more or less strong teeth at apex. Structure of spermatheca in species of this group similar in general plan: duct rather long and strongly curved, forming 1 or, less frequently, 2 loops usually situated in horizontal plane (Figs. 23–30).

A similar, rather long and strongly curved spermathecal duct is typical of *P. inflatus* Reiche, *P. gibbosus* All., *P. vehemens* Woll., *P. latifrons* Wse., and some other species. However, these species clearly differ from members of the *P. saulcyi* group in the shape of the duct curvature: the number of the loops is usually greater and their position may be horizontal and vertical (Leonardi, 1970). Nevertheless, the shape of the duct in species of the *P. saulcyi* group demonstrates a rather wide individual variability, which overlaps in different species and cannot be used for their identification.

A Key to Species of the *Psylliodes saulcyi* Group

- 1(8). Head and pronotum with steel-blue or greenish metallic luster. Upper side of body two-colored, mainly darker (head and pronotum rufescent brown or brown, elytra yellow or rufescent yellow).
- 2(7). Intervals between rows of punctures on elytra and punctures on pronotum convex.
- 3(4). Vertex with very coarse and large punctures; intervals strongly convex, with distinct wrinkles; frontal tubercles punctate on upper side, indistinct among sculpture of vertex, similarly to suborbital grooves (Fig. 4). Head and pronotum very wide; pygidium of female triangular, nearly sharp at apex. Aedeagus as in Figs. 33, 34.
..... *P. infandus* sp. n.
- 4(3). Punctures of vertex moderately large to nearly fine; intervals between punctures smooth, very weakly (if at all) convex; frontal tubercles impunctate on upper side and smooth, distinct among sculpture, similarly to suborbital grooves.
- 5(6). Aedeagus with short rounded teeth (Figs. 37, 38); suborbital grooves adjoining inner margins of eyes only in basal 1/3 (Fig. 1). Pygidium of female triangular, narrowly rounded at apex; base and apex of median groove widened (Fig. 16). Apical lobe of spiculum ventrale wide, nearly rhomboid, with large, widely spaced processes at sides; line at base of lobe obsolete, short, strongly curved (Fig. 22) *P. saulcyi* All.
- 6(5). Aedeagus with long sharp teeth (Figs. 31, 32); suborbital grooves adjoining inner margins of eyes in basal 2/3 (Fig. 2). Pygidium of female widely triangular, widely rounded at apex; base and apex of median groove narrowed (Fig. 13). Apical lobe of spiculum ventrale widely transverse, narrow; its lateral processes small and short, very closely adjoining lobe; line at base of lobe distinct, long, weakly curved (Fig. 13)
..... *P. analogicus* sp. n.
- 7(2). Intervals between rows of punctures on elytra and punctures on pronotum flat. Aedeagus as in Figs. 35, 36 *P. dilutellus* Hktg.
- 8(1). Head and pronotum without steel-blue or greenish metallic luster. Upper side of body two-colored, mainly pale (head and pronotum rufescent yellow, elytra yellow) or one-colored (upper side of body yellow).
- 9(10). Upper side of body yellow; intervals between rows of punctures on elytra very wide and weakly convex; those on disc 4–6 times as wide as puncture diameter; inner angle of elytral apex forming narrow process; apex of elytra distinctly emarginate (Fig. 9). Pygidium of female trapezoid, very widely rounded at apex (Fig. 11)
..... *P. grigorievi* Jcbs.
- 10(9). Upper side of body two-colored; intervals between rows of punctures on elytra very narrow and strongly convex, those on disc no more than 3 times as wide as puncture diameter; inner angle of elytral apex without process; apex of elytra smooth. Pygidium of female triangular, narrowly rounded at apex (Fig. 15)
..... *P. astenicus* sp. n.

Psylliodes saulcyi Allard, 1866

Allard, 1866 : 469.—*atriplicis* Jacobson, 1922 : 529; Heikertinger, 1926 : 125; Leonardi, 1970 : 214; Furth, 1983 : 46.

Gruev and Döberl (1997) indicated the Caucasus as the type locality of *P. saulcyi*. I did not examine the type material deposited in the Natural History Museum in Paris. However, the original description defi-

nately indicated that the material was collected in Syria. Thus, Syria should be regarded as the type locality.

Material. "Ul'yanovsk, Volga Area, 24.VIII.1962, A. Lyubishchev," 1 specimen (USNM); "Ul'yanovsk Staryi Venets-Pristan, 18.VIII.1967, A. Lyubishchev," 5 specimens (ZIN); "Ul'yanovsk Staryi Venets, 9.X.1967, A. Lyubishchev," 6 specimens (ZIN); "Akshuat, Bar., Ul'yanovsk Prov., 17.VIII.1967, A. Lyubishchev," 1 specimen (ZIN); "Lisichii Khutor, Ostrog u Voron. [in Cyrillic] [Voronezh Prov.] Silant'ev, 22.VIII.95," 2 specimens (ZIN); "Saratov, 21.IX.1935, Luk'yanovich," 2 specimens (ZIN); "Khanskaya stavka, Astrakh. gub., Plyushchevs.-Plyushch. [in Cyrillic] [Ural Prov.], 1 specimen (ZIN); "Astr.[akhanskaya gub.], 18.VIII.23, Belyi Ilmen Entom. St." [in Cyrillic], 1 specimen (ZIN); "Star. uch. [in Cyrillic] [Starobelskii site, Lugansk Prov.], 2 specimens (ZIN); "Drabovo Zolotonosh. [Cherkassk Prov.], 7.VIII.923, D. Ogloblin," 1 specimen (ZIN), 1 specimen (USNM); "Vel.-Anad. [in Cyrillic] [Veliko-Anadol'skii forest of Donetsk Prov.], mowing, 17.VIII.905," 2 specimens (ZIN); "Vladimirsk. zlaki [in Cyrillic] [? Prov.], 1 specimen (ZIN); Askaniya Nova, Tavrich. Distr., 27.VIII.923, D. Ogloblin on Atriplex" [Kherson Prov.], 1 specimen (ZIN); "Taganrog, Matissen," 1 specimen (ZIN); "Taganrog Alpheraki," 1 specimen (ZIN); "Environs of Odessa, Kuyal'nitskii Estuary, E. Lebedev, 8.IX.926," 4 specimens (USNM); "Izmailsk Prov., Balabanka Vill., 18.IX.52, Yu. Zaitzev" [Odessa Prov.], 1 specimen (USNM); "Transjordanien Jordantal, 4.IV.1958, Klapperich leg.," 1 specimen (USNM); "Dshabel Karantel près Jéricho, Davydov, 23.III.97," 1 specimen (ZIN); "Jerico" [Jericho, Israel], 1 specimen (LM); "Jerico" 1 specimen (MZHF); "Israel: Judäische Wüste Meizoke Dragot (oberhalb Westufer Totes Meer), 31°35'N, 35°23'E 4/5 März 1996," 1 specimen (MD).

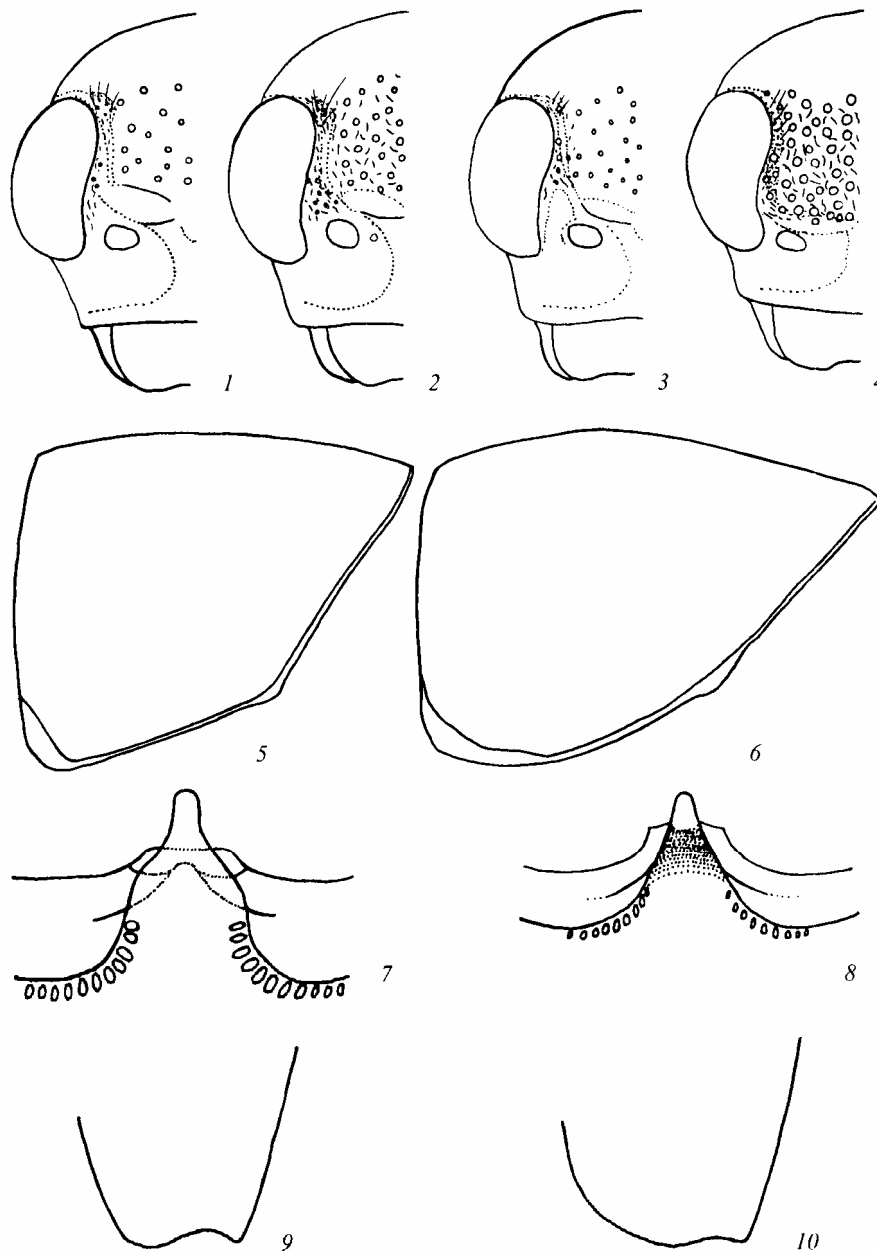
Description. Head rufescent brown, shining, with weak steel-blue luster; antennae yellow to brownish; antennal segments, beginning with 5th one, gradually darkened toward apex; pronotum brown, shining, with weak steel-blue or greenish luster; elytra rufous, with matte luster; pro- and mesothorax brown, metathorax rufescent brown to pitch-black; abdomen brown; fore and middle legs rufescent brown; hind femur brown to nearly black in middle and on upper side. Head conically narrowed, subtriangular (Fig. 1). Vertex wide, moderately convex, with coarse distinct shagreenity,

punctate only between eyes; punctures smaller than those on pronotum, distinct, irregularly arranged; frons less strongly punctate in middle, intervals between punctures 0.5–2.0 times as wide as puncture diameter, not convex, smooth. Upper inner margin of eyes with several fine indistinct setiferous pores not forming distinct depression; intervals between pores indistinctly wrinkled, setae short. Suborbital grooves usually distinct, reaching frontal tubercles, moderately deep, occasionally slightly wrinkled at bottom and along margins, occasionally obsolete, indistinctly separated from inner margins of eyes in basal 1/3, distant from them in apical 2/3; outer margins smooth, slightly convex. Frontal tubercles usually pronounced, very weakly convex, moderately projecting above surface of frons, elongate-rhomboid, nearly or absolutely smooth, separated by very fine lines on upper and lower sides; on lower side, line remaining on weakly depressed interval. Frontal carina wide, wider than long, weakly convex in middle, usually coarsely shagreened, covered with coarse punctures and depressions of irregular shape, frequently finely wrinkled. Antennal sockets not widely spaced, distance from them to anterior margin of frons 1.2–1.4 times diameter of antennal sockets. Anterior margin of frons straight. Labrum slightly wider than long; 2 median setiferous pores depressed. Mandibles very slightly projecting beyond anterior margin of labrum, rather narrow at base.

Pronotum 1.44 times as wide as long, punctation coarse, intervals between punctures convex; shagreenity coarse, occasionally smoothed or obliterate; anterior margin with row of short dense hairs.

Length of elytra 3.28 times that of pronotum, 1.52 times their maximum width; punctation large, rows of punctures on elytra forming no striae, or striae very shallow, intervals between rows of punctures usually flat or occasionally weakly convex, 2–3 times puncture diameter on disc and 1.5–2.0 times, on lateral and apical declivities. Secondary punctation usually distinct, consisting of mainly large punctures, their diameter about 0.3–0.5 times that of punctures in rows; secondary punctures forming in places 2 confused rows; inner apical angle of elytra obtuse and weakly rounded.

Pubescence of abdomen rather dense, hairs recumbent, mainly slightly longer than those on elytral epipleura; prominence of ventrite I forming short median process, weakly curved downwards.



Figs. 1–10. *Psylliodes* Latreille in Berthold: (1–4) head, front view [(1) *P. saulcyi* All., (2) *P. analogicus* sp. n., (3) *P. astenicus* sp. n., (4) *P. infandus* sp. n.]; (5, 6) contour of prothorax, lateral view [(5) *P. astenicus* sp. n., (6) *P. saulcyi* All.]; (7, 8) prominence of abdominal sternite I, ventral view [(7) *P. grigorievi* Jcbs., (8) *P. dilutellus* Hktg.]; (9, 10) contour of elytral apex, dorsal view [(9) *P. grigorievi* Jcbs., (10) *P. dilutellus* Hktg.].

Apical 1/3 of hind tibia narrow, distinctly constricted in middle.

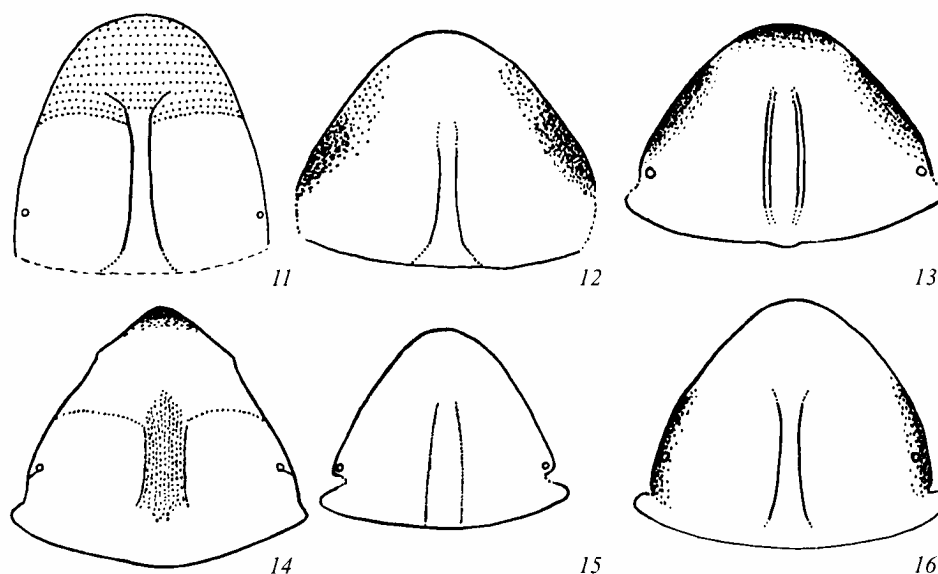
Aedeagus moderately strongly curved in lateral view, distinctly shortly widened in middle, with very short rounded teeth at apex (Figs. 37, 38).

Pygidium of female triangular, shortly rounded at apex; its groove originating at base, fine, occupying 2/3 of length, widened at ends (Fig. 16). Spiculum ventrale with nearly rhomboid apical lobe bearing

long, widely spaced processes at sides, with short curved obsolete line at base (Fig. 22). Spermatheca as in Figs. 25, 29.

Body length 1.82–2.47 mm, width 0.87–1.25 mm.

Differential diagnosis. The new species is closely related to *P. analogicus* sp. n. and *P. infandus* sp. n. and differs in the shorter and obtused teeth at the apex of the aedeagus, triangular and widely apically rounded pygidium of the female, shape of the spicu-



Figs. 11–16. *Psylliodes* Latreille in Berthold., pygidium of female, dorsal view: (11) *P. grigorievi* Jcbs., (12) *P. dilutellus* Hktg., (13) *P. analogicus* sp. n., (14) *P. infandus* sp. n., (15) *P. astenicus* sp. n., (16) *P. saulcyi* All.

lum ventrale, and narrower hind tibia stronger constricted in the middle of apical third. The new species differs from *P. analogicus* sp. n. in the finer and sparser sculpture of the head and arrangement of the suborbital groove adjoining the eyes only in basal third. It differs from *P. infandus* sp. n. in the narrower head, considerably finer and sparser sculpture, distinct smooth frontal tubercles, and well-visible suborbital groove.

Biology. This species is xerophilous, inhabits steppe areas, pastures, forest edges. The host plants are *Atriplex lacinata* and *A. halimus* (Jacobson, 1922; Shapiro, 1963; Furth, 1983).

Distribution. The south of the European part of Russia within the limits of steppes and semideserts (Voronezh, Rostov, Saratov, and Ul'yanovsk Provinces), steppe part of the Ukraine (Cherkassk, Donetsk, Kharkov, Lugansk, Odessa, and Kherson Provinces), Armenia, Kazakhstan (Ural Province), Syria, Jordan, Israel, Iran, Iraq, Cyprus, Egypt.

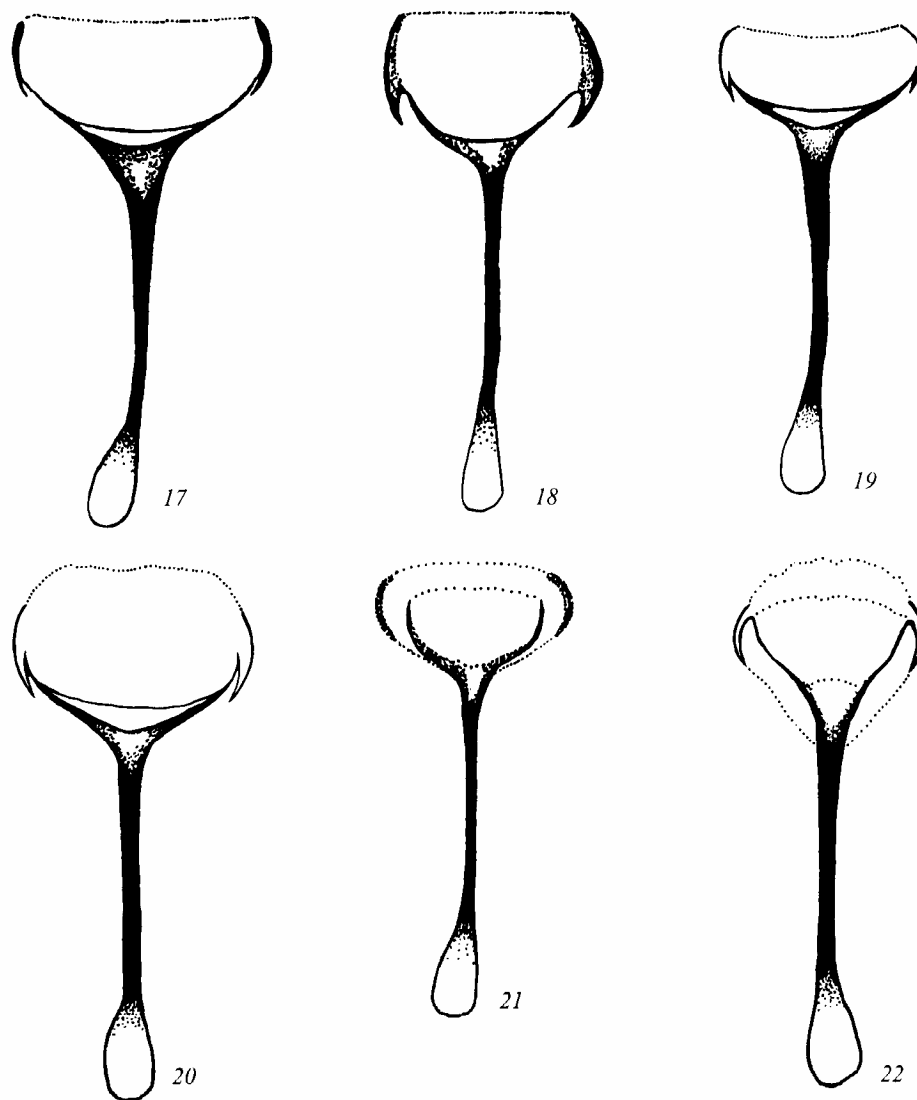
Psylliodes infandus Nadein, sp. n.

In a number of publications (Lopatin, 1975; Medvedev, 1982; Gruev, Döberl, 1997), *P. saulcyi* was also recorded from Mongolia under the name *P. atriplicis*. An examination of the material has shown that this records should be referred to a new species.

Material. Holotype (♂): "Mongolia, 30 km N Ikh-Khaviin-Nuru Mt. Range, Kobdos aimak, Kozlov,

10.VIII.968," (ZIN). Paratypes: same locality, 1 ♂ (ZIN); 1 ♂, 1 ♀ (USNM); "Mongolia, 30 km N Ikh-Khaviin-Nuru Mt. Range, Kobdos aimak, Nartshuk, 26.VII.970," 1 ♀ (ZIN); same locality, 1 ♀, (USNM).

Description. Male. Head and pronotum brown, with greenish bronze luster; labrum darker; 4 basal antennal segments dark rufous, apical segments brownish; elytra rufescent yellow, with matte luster; prothorax rufescent brown, meso- and metathorax dark brown; abdomen dark brown; fore and middle legs rufous; hind femur brown, nearly black in middle and on upper side. Head very wide, widely trapezoid, wider than long (Fig. 4). Vertex very wide and flat, with coarse shagreenity; punctures on vertex large, coarse, as large as, or larger than those on pronotum, irregularly arranged, separated by strongly convex and wrinkled intervals. Setiferous pores forming no depression, partly adjoining suborbital grooves, with rather short setae. Suborbital grooves wide, with wrinkled margins and bottom, adjoining eyes along entire length (except for end), separated from eyes only by very short wrinkled interval hardly visible on background of sculpture. Frontal tubercles indistinct among wrinkles, very weakly convex, narrow, punctate and wrinkled on upper side, not separated on upper side and very weakly separated on lower side by narrow line hardly visible among punctures, widely spaced, divided in middle by wide shallow depression. Frontal carina very wide, very weakly convex, nearly flat in middle, coarsely shagreened, wrinkled, with dense



Figs. 17–22. *Psylliodes* Latreille in Berthold, speculum ventrale: (17) *P. grigorievi* Jcbs., (18) *P. dilutellus* Hktg., (19) *P. analogicus* sp. n., (20) *P. infandus* sp. n., (21) *P. astenicus* sp. n., (22) *P. saulcyi* All.

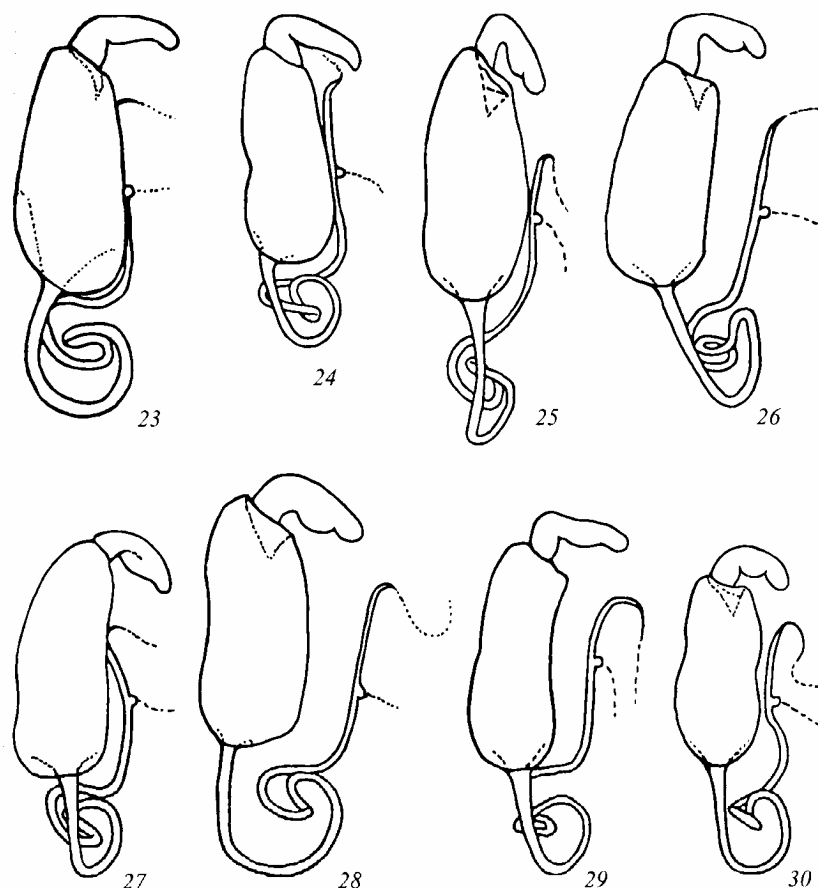
indistinct punctation. Antennal sockets very widely spaced, distance from them to anterior margin of frons not exceeding their diameter. Anterior margin of frons straight. Labrum short, rather narrow. Mandibles very slightly projecting beyond anterior margin of labrum, not wide at base.

Pronotum 1.47 times as wide as long. Punctures dense, coarse, not smaller than those on elytral disc; intervals between punctures not exceeding half their diameter, convex, with tendency toward formation of short wide flattened wrinkles, with indistinct smoothed shagreenity; anterior angles well visible in dorsal view, projecting, triangular in lateral view; lateral margin of pronotum straight in dorsal view.

Length of elytra 3.69 times length of pronotum and 1.66 their maximum width. Rows of punctures on elytra not forming distinct striae; punctures large, as large as, or larger than those on pronotum; intervals between rows 2.0–2.5 times puncture diameter on disc and 1–2 times, on lateral and apical declivities; intervals between punctures in rows weakly convex, with slightly coarse, smoothed sculpture; secondary punctures distinct, large, shallow, 0.3–0.5 times as large as punctures in rows. Elytral apex widely rounded, inner angle forming no tooth.

Prominence of abdominal ventrite I triangularly conical, with apex forming no process.

Apical 1/3 of hind tibia wide, weakly constricted in middle at sides.



Figs. 23–30. *Psylliodes* Latreille in Berthold., spermatheca: (23, 24) *P. dilutellus* Hktg. [(23) “Mujunkum Fisher,” (24) “W Mujunkum Akmolinsk A. Kricheldorff”]; (25, 29) *P. saulcyi* All. [(25) environs of Odessa, (29) Saratov]; (26) *P. infandus* sp. n.; (27) *P. analogicus* sp. n.; (28) *P. grigorievi* Jcbs.; (30) *P. astenicus* sp. n.

Aedeagus weakly curved in lateral view, uniformly widened toward basal 1/3; its apex slightly curved forwards, with well-developed teeth; apical tooth not forming long process (Figs. 33, 34).

Female. Pygidium triangular, nearly sharp at apex; median groove wide and short, occupying about 1/3 of pygidium length (Fig. 14). Spiculum ventrale with wide apical lobe and moderately long, tapered processes at sides appressed to apical lobe; base with long fine distinct line (Fig. 20). Spermatheca as in Fig. 26.

Body length 2.7 mm, width 1.27 mm in holotype; 2.48 mm and 1.18–1.35 mm, respectively, in paratypes.

Differential diagnosis. *P. infandus* differs from *P. saulcyi* in the aedeagus less strongly curved in lateral view and bearing larger teeth at the apex. It differs from *P. analogicus* sp. n. in the shorter and less elongate apical tooth of the aedeagus; from *P. saulcyi* and *P. analogicus* sp. n., in the structure and shape of the

female pygidium: nearly sharp at apex and with short and wide groove in middle of its surface; spiculum ventrale with wide apical lobe and distinct fine line at base of lobe. *P. infandus* also differs in the very wide head and pronotum, very coarse sculpture of the head, punctate frontal tubercles, and widely spaced antennal sockets.

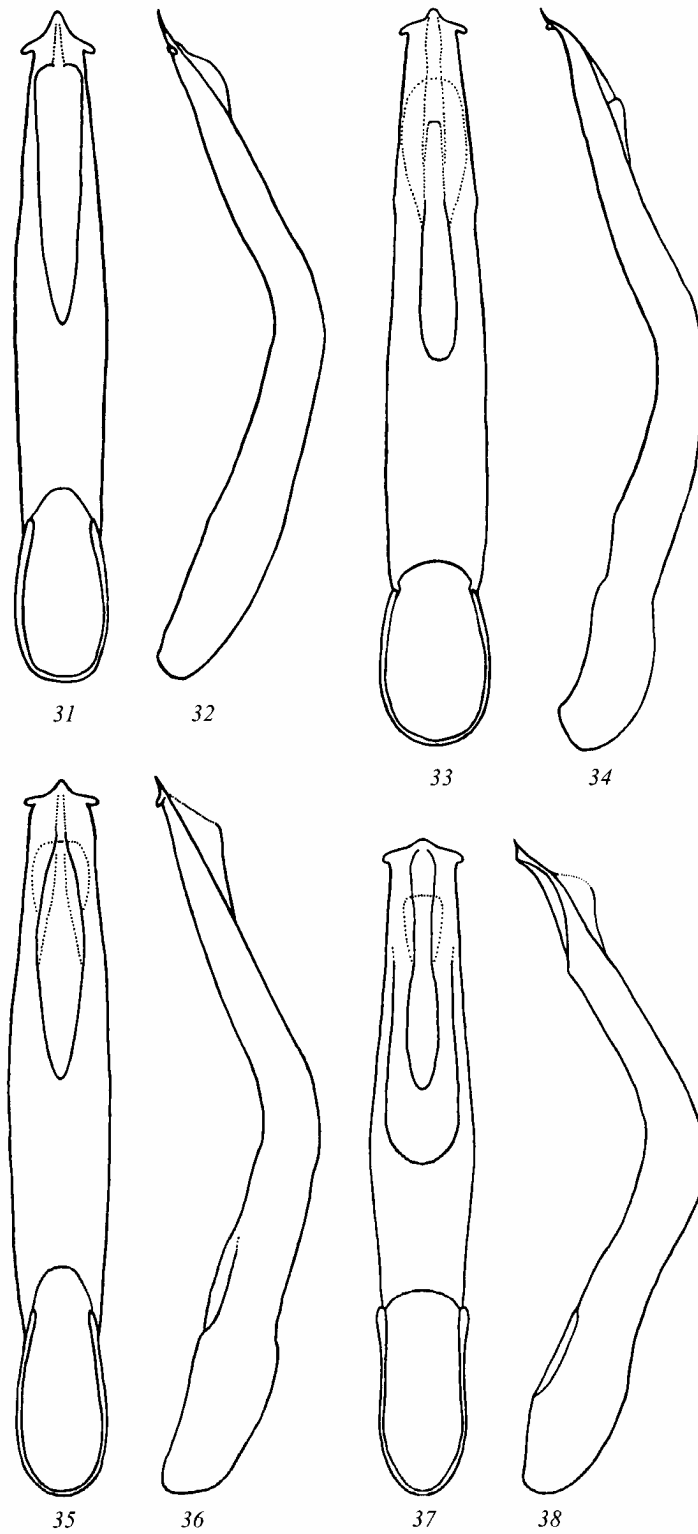
Distribution. Southwestern Mongolia (Kobdos aimak). The presence in China is possible.

Three paratypes are deposited in the Natural History Museum, Washington, USA.

Psylliodes grigorievi Jacobson, 1922

Jacobson, 1922 : 530; Heikertinger, 1926 : 125; Leonardi, 1970 : 214; Lopatin, 1977 : 241.

The status of *P. grigorievi* long remained obscure. Lopatin (1977) and Gruev and Döberl (1997), referring to Lopatin, pointed out relationships between



Figs. 31–38. *Psylliodes* Latreille in Berthold., aedeagus, dorsal (31, 33, 35, 37) and lateral (32, 34, 36, 38) view: (31, 32) *P. analogicus* sp. n.; (33, 34) *P. infandus* sp. n.; (35, 36) *P. dilutellus* Hktg.; (37, 38) *P. saulcyi* All.

P. grigorievi and *P. dilutellus* and supposed that *P. grigorievi* was not a separate species.

Comparison of the type and additional material on *P. dilutellus* and *P. grigorievi* has revealed clear distinctions between these species. I consider it groundless to relate these species. *P. grigorievi* clearly differs from *P. dilutellus* and other species of the group in the larger size, convex vertex and frontal carina, smooth and even margins of the setiferous depressions, fine and superficial punctation of the head, large and nearly square labrum, wide mandibles distinctly projecting beyond the anterior margin of the labrum, very large anterior angle of the pronotum, wide intervals between rows of punctures on the elytra (4–6 times their diameter, in contrast to no more than 4 times in other species), inner angle of the elytral apex in the form of elongate process (Fig. 9), spiculum ventrale with a wide apical lobe truncate on the upper side and with narrow and closely adjoining processes at sides (Fig. 17), trapezoid pygidium widely rounded at the apex (Fig. 11), and longer and denser pubescence of the abdomen. It also differs from *P. dilutellus* in the shape of the prominence of abdominal ventrite I (Figs. 7, 8) and the elytral apex (Figs. 9, 10).

P. grigorievi was described by Jacobson from two specimens without designation of the holotype. One specimen is deposited in the collection of ZIN. Depository of the second specimen is unknown. The lectotype is designated here, it is a female with labels: one printed “Ferghana sept. Namangan, Min-Bulak (Syr-Darja), 23.V.08 B. Grigoriev;” one hand-written “Sarysu Sands;” and one printed, red “Lectotypus *Psylliodes grigorievi* Jacobson Nadein K. des. 2005.”

The original description made by Jacobson in Latin language is rather brief; therefore, I give redescription of this species.

Redescription. Head rufous, with matte luster; labrum brown; antennae yellow, with 4 apical segments slightly darker; pronotum and elytra yellow, with matte luster; pro- and mesothorax yellow; metathorax pale rufous; abdomen rufous; fore and middle legs yellow, hind leg pale brown, upper margin of hind femur darkened. Vertex convex, indistinctly shagreened, slightly wrinkled; punctures fine, smaller than those on pronotum and elytra, superficial, irregularly arranged, with tendency toward merging. Setiferous depressions distinct, deep, with smooth even margins, with only several very weak wrinkles. Suborbital grooves adjoining inner margin of eyes only at base,

originating from setiferous depressions; margins of groove shallow, indistinct, with smooth wrinkles. Frontal tubercles narrow, divided in middle by weak longitudinal depression, convex, separated on lower side by fine superficial line, not separated on upper side. Frontal carina as long as wide, elevated above plane of frons, convex in lateral view, with vague coarse sculpture, without large lateral depressions formed by antennal sockets. Anterior margin of frons straight. Labrum only slightly wider than long; 2 median setiferous pores large, deep, separated by convex interval. Mandibles large, wide at base, distinctly projecting beyond anterior margin of labrum.

Pronotum 1.52 times as wide as long; punctures on disc deep, dense, as large as, or slightly larger than those on elytral disc; intervals between punctures not exceeding half puncture diameter, convex, with tendency toward formation of short wrinkles, indistinctly shagreened, nearly smooth; anterior angle very large, well-visible in dorsal view, strongly projecting beyond lateral contour, oblong-triangular in lateral view.

Elytra 3.7 times as long as pronotum, 1.7 times as long as wide; punctation medium-sized; punctures in rows very dense, forming distinct striae; intervals between striae 4–6 times puncture diameter on disc and 3–4 times, on lateral and apical declivities; intervals convex, nearly smooth; secondary punctation well developed, punctures large; apex of elytra moderately deeply emarginate, inner angle in the form of process (Fig. 9).

Abdominal ventrites densely pubescent; hairs usually not shorter than those on elytral epipleura; prominence of ventrite I wide and strongly projecting forwards, apex in the form of long process (Fig. 7).

Pygidium trapezoid, very widely rounded at apex; its groove situated at base, occupying 3/4 of its lengths, widened at ends (Fig. 11). Spiculum ventrale with narrow processes closely adjoining its sides (Fig. 17) and with rectangular apical lobe bearing at base fine, weakly curved line. Spermatheca as in Fig. 28.

Body length 2.7 mm, width 1.25 mm.

Distribution. Uzbekistan: Ferghana Valley.

Psylliodes dilutellus Heikertinger, 1911

Heikertinger, 1911 : 22; 1926 : 125; Bechyné, 1956 : 583; Leonardi, 1970 : 214; Lopatin, 1977 : 241.

Material. Lectotype: ♂, “W Mujunkum, Akmolinsk, A. Kricheldorf” (NHMB); same locality, 2 specimens (ISNB); same locality, 2 specimens (USNM); “Mujunkum Fisher,” 2 specimens (ZIN); same locality, 2 specimens (USNM); “Talas Mt. Range. Yu. P.” [in Cyrillic], 1 specimen (LM); “S Tajikistan “Tigrovaya Balka” Nature Reserve, 17.V.59, Lopatin,” 1 specimen (USNM).

The label of the type specimen of *P. dilutellus* indicates two collecting sites, Akmolinsk and Muyunkumy Sands, separated by a distance exceeding 700 km. Bechyne (1956) designated the lectotype of *P. dilutellus*, but indicated no type locality. Gruev and Döberl (1997) chose Akmolinsk: “Akmolinsk (= Tselinograd).” The lectotype of *P. dilutellus* is identical to the examined specimens from Muyunkumy Sands. In Central Kazakhstan (Akmolinsk Province), *P. dilutellus* has not been recorded. Therefore, Muyunkumy Sands are most likely the type locality.

Description. Head rufous, with matte luster; labrum brown; antennae rufous, gradually becoming darker toward apex beginning with 4th segment; pronotum rufous, shining; elytra rufescent yellow, with matte luster; prothorax rufous, mesothorax darker, metathorax brown to dark brown; abdomen rufous; fore and middle legs rufous, hind femur dark rufous, tibia yellow. Vertex wide, flat, with distinct fine shagreenity; punctures fine, sparse, superficial, separated by intervals exceeding their diameter. Setiferous depression large, with uneven, coarsely wrinkled, and punctate margins. Suborbital grooves indistinct, very shallow, almost immediately separated from setiferous depression in upper inner angle of eyes; margins of groove indistinct, vague, wrinkled. Frontal tubercles medium-sized, nearly flat, smoothed, not separated on upper side, divided by deep depression in middle. Frontal carina trapezoid, weakly convex; lateral margins bounded by depressions of antennal sockets; surface uneven, with several sparse fine superficial punctures. Anterior margin of frons straight. Labrum medium-sized, much wider than long, trapezoid; two inner setiferous pores fine, shallow. Mandibles short, not projecting beyond anterior margin of labrum, rather narrow at base.

Pronotum 1.49 times as wide as long, with indistinct smoothed fine shagreenity; punctures moderately dense, medium-sized, intervals between punctures usually 2–3 times puncture diameter; punctures on disc larger than those on head, but smaller than those on elytra, intervals flat; anterior and posterior angles medium-sized in dorsal view, weakly projecting.

Elytra nearly smooth, 2.47 times as long as pronotum, 1.45 times as long as wide; punctures in rows larger than those on pronotum; intervals between rows of punctures flat, 3–5 times puncture diameter on disc and 2–3 times that on lateral and apical declivities; distance between punctures in rows 1.5–2.0 times puncture diameter; rows of punctures not forming depressed striae; secondary punctation indistinct, punctures very fine, smoothed, shallow, occasionally almost disappearing on disc; inner apical angle of elytra forming, at most, very short prominence with small emargination before it (Fig. 10).

Pubescence of abdomen sparse, hairs short; prominence of ventrite I triangular, weakly projecting forwards, its apex in the form of short process (Fig. 8).

Apical 1/3 of hind tibia weakly constricted in middle.

Aedeagus curved in lateral view (nearly as that in *P. saulcyi*), weakly widened in middle, with well-developed teeth at apex; median tooth not elongate to form long process (Figs. 35, 36).

Pygidium of female triangular, widely rounded at apex, with narrow groove situated in basal 2/3 and strongly widened at base (Fig. 12). Spiculum ventrale (Fig. 18) with wide, nearly square apical lobe without line at base; lateral processes wide, merging with lobe in basal 2/3. Spermatheca as in Figs. 23, 24.

Body length 2.3–2.6 mm, width 1.22–1.4 mm.

Differential diagnosis. *P. dilutellus* occupies an isolated position in the group, being similar to *P. saulcyi*, *P. analogicus* sp. n., and *P. infandus* sp. n. It primarily differs from other species of the group in the flat intervals between punctures on the pronotum and those between rows of punctures on the elytra. In addition, *P. dilutellus* differs from *P. analogicus* sp. n. in the apical tooth of the aedeagus, not elongated into a process; from *P. infandus* sp. n. and *P. analogicus* sp. n., in the median groove on the surface of the pygidium, widened at the base and narrow at the apex; from *P. saulcyi*, *P. analogicus* sp. n., and *P. infandus* sp. n. in the wide lateral processes and absence of a line at base of the lobe of the spiculum ventrale.

Biology. Beetles feed on Solanaceae (Lopatin, 1986).

Lopatin (1959, 1977, 1986) indicates the following territories of the distribution of *P. dilutellus*: Uzbekistan (Ferghana Valley), Kirghizia (Aktal River, near

Naryn), Kazakhstan (Syr-Darya River valley, Muyunkumy Sands), and Tajikistan (lower course of Vakhsh River). Examination of the material has shown that the species is actually distributed in the southern part of Kazakhstan (Muyunkumy Sands), northern part of Kirghizia (Talas Range), and southern part of Tajikistan ("Tigrovaya Balka" Nature Reserve). The record from Uzbekistan should be referred to *P. grigorievi*. The records from Kirghizia (Aktal River, near Naryn) and southern Tajikistan (Vakhsh River) are referred to 2 new species described below.

Psylliodes analogicus Nadein, sp. n.

Material. Holotype (♂): "Central Tien Shan, Aktal River, 80 km W Naryn, E. Guryeva, 10.VII.966," "alkali-soil desert and floodland" (ZIN). Paratypes: same locality, 2 specimens (♀) (ZIN).

Description. Male. Head brown, with greenish luster; labrum darker; 3 basal antennal segments rufescent, then gradually becoming brownish toward apex. Pronotum rufous, paler than head, with same luster; elytra yellowish rufous; prothorax pale brown, meta- and mesothorax and abdomen nearly black; fore and middle legs rufescent yellow; hind femur dark brown; dorsal side nearly black (Fig. 2). Vertex with large deep punctures not larger, mainly smaller than those on pronotum, dense; intervals between punctures convex, slightly wrinkled in places, not wider (usually narrower) than puncture diameter; shagreenity coarse, distinct. Setiferous pores forming at upper inner angle of eyes distinct depression with wrinkled intervals, setae moderately long. Suborbital grooves at inner margins of eyes originating from accumulation of setiferous pores, adjoining eye in basal 2/3, not separated from it by interval, shallow and rather narrow, wrinkled, nearly reaching frontal tubercles, disappearing among sculpture near them. Frontal tubercles obsolete, slightly convex, nearly smooth, not separated distinctly on upper and lower sides, divided by rather deep large depression in middle. Frontal carina wide, nearly flat, coarsely and irregularly covered with indistinct punctures, weakly wrinkled, and shagreened; intervals occasionally almost smooth. Anterior margin of frons straight. Labrum rather large, wide; anterior margin shallowly emarginate, 2 median setiferous pores on labrum large and moderately deep. Mandibles very weakly projecting beyond anterior margin of labrum, rather narrow at base.

Pronotum 1.36 times as wide as long; punctation dense, intervals between punctures not exceeding

1 puncture diameter, secondary punctation absent, intervals convex, with fine distinct shagreenity, with weak tendency toward formation of short vague wrinkles. Anterior angles of pronotum moderately strongly projecting beyond lateral contour, base weakly (but distinctly) convex in middle, lateral margin with row of short erect hairs.

Elytra 1.46 times as long as pronotum and 3.13 as long as wide. Punctures in rows on elytra large, nearly merging at apices, rows forming deep striae, intervals between punctures in rows less than half of puncture diameter; intervals between rows usually convex, 2.0–2.5 times puncture diameter on disc and 1–2 times, on lateral and apical declivities; secondary punctation indistinct, semi-obliterated, irregular, consisting of minute smoothed punctures nearly absent in places; elytral apex nearly straight before inner angles, without distinct emargination; inner angle very weakly projecting.

Pubescence of abdominal ventrites weak, hairs short; prominence of ventrite I short, distinctly curved in lateral view.

Apical 1/3 of hind tibia weakly constricted at sides in middle.

Aedeagus weakly curved in lateral view, very weakly widened in middle, with well-developed teeth at apex; apical tooth elongate to form long process (Figs. 31, 32).

Female. Pygidium widely triangular, widely rounded at apex; median groove situated nearly in middle of its surface, moderately wide, narrowed at both ends (Fig. 13). Spiculum ventrale with narrow, widely transverse lobe; its apical margin slightly emarginate; line at base of lobe rather narrow and rather short, weakly curved (Fig. 19). Spermatheca as in Fig. 27.

Body length 2.28 mm, width 1.18 mm in holotype; 2.4–2.53 mm and 1.18–1.25 mm, respectively, in paratypes.

Differential diagnosis. *P. analogicus* is most closely related to *P. saulcyi* and reliably differs from it in the structure of the genitalia. It clearly differs from *P. saulcyi* and *P. infandus* sp. n. in the structure of the aedeagus: aedeagus weakly widened in middle, with well-developed teeth at apex, apical tooth elongate to form in long process. *P. analogicus* differs from *P. saulcyi* and *P. infandus* sp. n. in the structure of the female pygidium: median groove on its surface situ-

ated nearly in middle, moderately wide, narrowed at both ends. It differs from *P. saulcyi* in the arrangement of the suborbital grooves adjoining the inner margins of the eyes in basal 2/3 and in the deeper accumulations of setiferous pores around the eyes. The sculpture of the vertex and frons in *P. analogicus* is coarser than that in *P. saulcyi*, but less coarse than that in *P. infandus* sp. n.

Distribution. Kirghizia: Central Tien Shan.

Psylliodes astenicus Nadein, sp. n.

Material. Holotype (♀): “Dzhalikul, Vakhsh River, 15.VI.34 V. Gussakovskij” (ZIN). Paratypes: same locality, 1 ♀ (ZIN); same locality, 1 ♀ (USNM).

Description. Head and pronotum rufescent brown, shining; labrum brown. Elytra rufescent yellow, with weaker matte luster; pro- and mesothorax rufescent brown, metathorax brown; abdomen pale brown; fore and middle legs yellow; hind femur brown, its apical 1/3 dark brown, nearly black on upper side; hind tibia and tarsus rufescent brown. Vertex convex in lateral view; punctures distinct, rather deep, of the same size as some small punctures on pronotum, arranged rather irregularly, separated by intervals 1.5–2.0 times puncture diameter (Fig. 3). Accumulations of setiferous pores in upper inner angle of eyes moderately depressed, pores distinct, intervals between them nearly smooth, setae long. Suborbital grooves moderately deep only in upper inner angle of eyes, reaching frontal tubercles, gradually narrowed up to fine lines toward frontal tubercles, closely adjoining inner margin of eye at place of accumulation of setiferous pores, forming there (together with pores) rather narrow wrinkled depression with nearly smooth margins; apical 3/4 of grooves separated from inner margin of eyes by wide, slightly wrinkled, punctate, gradually widening intervals. Interval between bases of antennae and eyes deeply depressed, this depression nearly reaching suborbital grooves. Frontal tubercles narrow, weakly convex, nearly smooth, separated by fine lines on upper side and on lower side, divided by superficial depression. Frontal carina weakly projecting above surface of frons in lateral view, moderately wide, flattened on upper side, nearly even, indistinctly and very weakly wrinkled and superficially punctate, with smoothed sculpture, nearly smooth at base. Anterior margin of frons straight. Labrum trapezoid, transverse; anterior margin slightly emarginate; 2 inner setiferous pores moderately large and deep; interval between them weakly convex.

Pronotum 1.47 times as wide as long; distinctly narrower than elytra at base; its anterior and lateral margins nearly straight, weakly convex; basal margin widely uniformly rounded; anterior angles rounded, medium-sized, weakly projecting beyond lateral contour of pronotum; punctuation of surface irregular, sparser on disc, punctures varying in size, largest punctures of the same size as punctures on elytra; intervals between punctures 0.5–2.5 times their diameter, with fine smoothed shagreenity, very weakly convex, flat in places, distinctly convex on lateral declivity.

Elytra 3.36 times as long as pronotum, 1.52 times as long as wide; rows of punctures on elytra reaching their apex, very deep; intervals between them very convex, narrow, nearly smooth; secondary punctuation consisting of very fine, sparse punctures; intervals between rows no more than 2.5 times puncture diameter on disc and 1.5–2.0 times, on lateral declivity. Intervals between punctures in rows 0.5–1 times puncture diameter; inner angle of elytral apex rounded, obtuse, not elongated to form process; apices straight before inner angle; epipleura rather sparsely pubescent.

Pubescence of abdomen moderately dense; hairs long; prominence of ventrite I triangular, its base elongated to form short obtuse process, widely rounded in lateral view.

Pygidium triangular, rather narrowly rounded at apex; groove on its surface moderately wide, occupying basal 2/3, nearly parallel-sided at base, slightly narrowing at apex (Fig. 15).

Apical 1/3 of hind tibia wide, weakly constricted.

Spiculum ventrale with ellipsoidal apical lobe, without pronounced processes at sides, only with more strongly sclerotized arcuate areas; ellipsoid area with sclerotized base and margins (Fig. 21) situated inside lobe. Spermatheca as in Fig. 30.

Body length 2.07 mm, width 1.05 mm in holotype; 2.07–2.1 mm and 1.0–1.25 mm, respectively, in paratypes.

Differential diagnosis. *P. astenicus* differs from *P. saulcyi* and *P. analogicus* sp. n. in the absence of metallic luster on the pronotum and head, very narrow and strongly convex intervals of the elytra, finer and sparse punctuation of the vertex, presence of depressed interval between the frontal tubercles, inner margin of the eyes, and bases of the antennae (Fig. 3), and also

in the triangular pygidium, wider groove on its surface, its arrangement at the base of the pygidium, and absence of lateral projecting processes and line at the base of the lobe of the spiculum ventrale. It also clearly differs from *P. saulcyi* in the shape of the prothorax (Figs. 5, 6).

Distribution. Southern Tajikistan.

One paratype is deposited at the Natural History Museum, Washington, USA.

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