New species of the genus *Pseudotaphoxenus* Schaufuss from Palaearctic Asia (Coleoptera: Carabidae)

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Six new species of the genus *Pseudotaphoxenus* are described: *P. igori* sp. n., *P. kurdaiensis* sp. n., *P. ferghanenses* sp. n. and *P. putshkovi* sp. n. from Tien Shan, *P. zvarici* sp. n. and *P. optatus* sp. n. from China.

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This paper is based on the collections of the Zoological Institute, St.Petersburg, and of I.I. Kabak, Alma-Ata. The following measurements were taken: body length from anterior margin of labrum to elytral apex; head width across eyes; pronotal and elytral width at their broadest part; width of pronotal base at the level of posterior lateral setae; pronotal length along its median line; elytral width at the humeral denticles; elytral length from tip of scutellum to their apex. Holotypes of the new species, except *P. zvarici* sp. n., are preserved in the collection of the Zoological Institute, Russian Academy of Sciences, most of the paratypes – in the collections of the Institute of Zoology of the National Academy of Sciences of Kazakhstan Republic (Alma-Ata) and Moscow Pedagogical University.

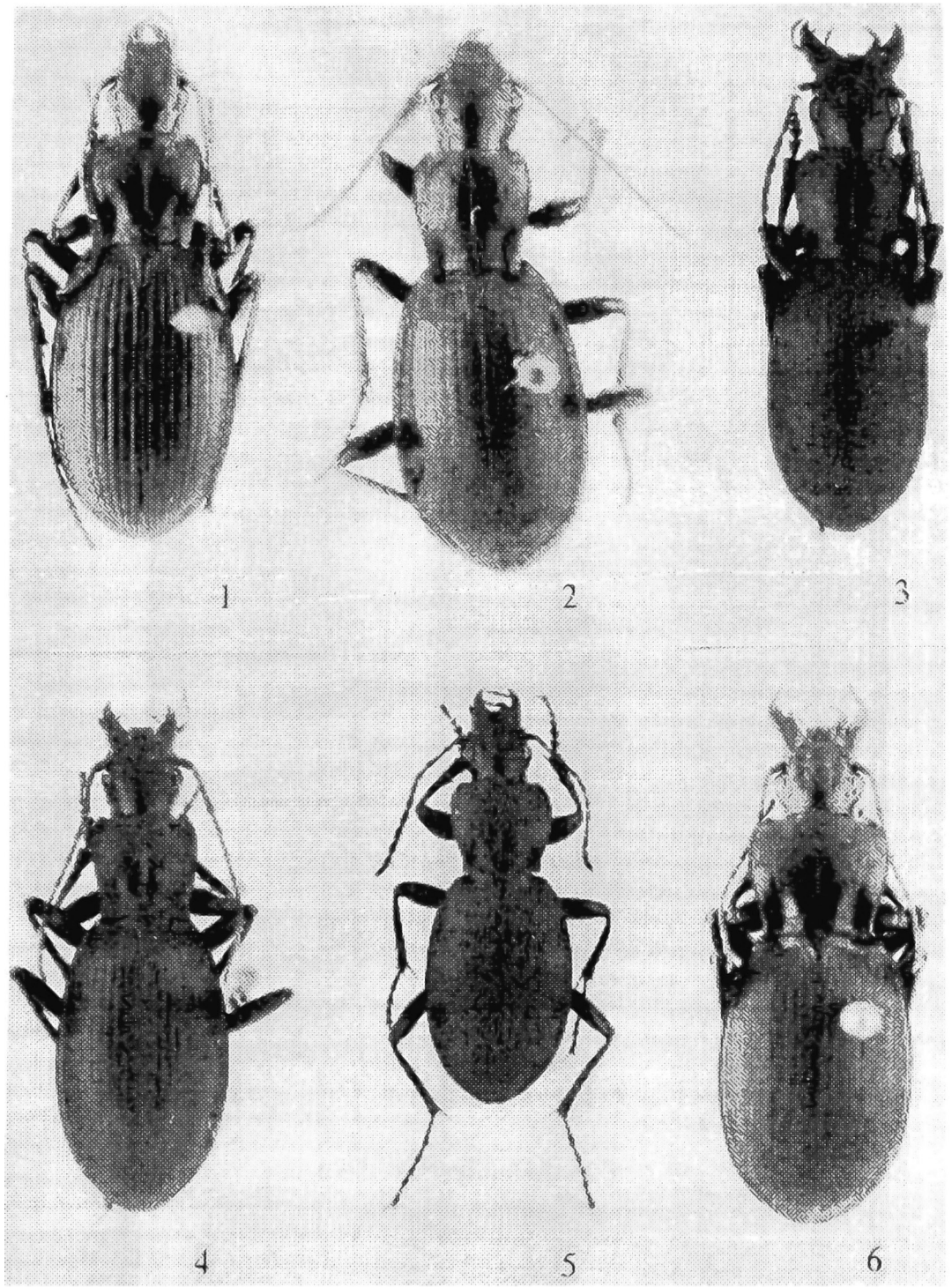
Pseudotaphoxenus igori sp. n.

(Figs 1, 7-9)

Holotype. ♂, **Kazakhstan**, Ketmen Mts., 10 km S of Bolshoy Ketmen, 1700 m, meadow, 14.V.1989 (I. Kabak).

Paratypes. **Kazakhstan**: 1 ♀, Ketmen Mts., Tuyuk, low zone of fir tree forest, 1500 m, 16.V.1986 (I. Belousov); 2 ♀, eastern spur of Terskey Alatau, Elshen-Buyruk, 2 km S of Karasaz, 1700 m, steppe slope, 25.VI.1987 (I. Kabak); 1 ♂, same locality, 1500 m, 26.VI.1987 (Kadyrbekov); 1 ♂, 1 ♀, Ketmen Mts. near Kegen, 1400-1700 m, 12-18.VI.1990 (E. Komarov); 1 ♀, Toraigyr Mts., 32 km NE of Dzhalanash, 1200 m, meadow, 10.VI.1987 (I. Kabak); 1 ♀, Zailiysk Alatau, left tributary of Dzhenishke River, 30 km upstreams of Koksay, 21.VI.1988 (M. Childebaev); 1 ♀, Temirlik Riv., near Kegen Pass, 8.VI. 1993 (S. Ovchinnikov); 1 ♂, 1 ♀, southern slope of Ketmen Ridge, 20 km S of Sarydzhas, 2100-3000 m, 2-3.VI.1988 (G.S. Medvedev); 1 ♀, 20 km E of Kegen, 1700 m, 5.VIII.1969 (Marikovskaja).

Description. Body 15.6-17.9 mm long; slender, flattened, brownish-black, weakly shining; antennae, palpi and tarsi dark brown. Head with well developed furrows; eyes moderately convex, as long as the convexly rounded temples. Pronotum weakly narrowed to base, cordate, 1.02-1.06 times as wide as long, sides straight or weakly sinuate posteriorly. Anterior angles extended, rounded at tip. Lateral beading moderately wide. Hind angles almost right, sharp, slightly protruding backward. Basal foveae elongate, distinct, weakly wrinkled, sometimes faintly punctate near hind angles; base almost straight or weakly excised medially. Median line deep, reaching or almost reaching base of pronotum. Elytra oval, 1.6-1.7 times as long as wide; striae deep, with traces of punctation; intervals moderately convex; humeral edge almost straight or weakly rounded, humeral denticles well developed, widely rounded at tip. Prescutellar pores present. Lateral margin with a wide raised edge; series umbilicata with 26-28 pores; 2



Figs 1-6. *Pseudotaphoxenus*, general view. **1,** *P. igori* sp. n. (♂, paratype, Kegen Pass); **2,** *P. kurdaiensis* sp. n. (holotype); **3,** *P. ferghanensis* sp. n. (♂, paratype, Dzhelal-Abad); **4,** *P. putshkovi* sp. n. (holotype); **5,** *P. zvarici* sp. n. (holotype); **6,** *P. optatus* sp. n. (♂, paratype).

preapical pores present. Male hind tibiae straight, with a fringe of yellowish golden hairs. Dorsal surface of hind tarsi almost smooth; segments of middle and hind tarsi with longitudinal furrows towards the bases. Basal segments of middle and hind tarsi sometimes with a few hairs on upper surface. Penis widened at apex (Figs 7, 9), apical disc well developed; right paramere as in Fig. 8.

Geographical variation. There are 3 specimens [1 ♂ (16.8 mm), S. Kazakhstan, Zhetyzhol, near Sergievka, 1500 m, 14.V.1987 (S. Murzin); 1 ♂ (15.4 mm), Boom Gorge, 1.V.1954 (S. Ovchinnikov) and 1 ♀ (16.5 mm), eastern part of Kirghizian Oktorkoy Ridge, 15 km S of Orlovka, 10.VI.1992 (S. Ovchinnikov)] differing from the others in the slightly more produced and more rounded hind angles of pronotum and apical disc of penis narrower with angles less dilated. These specimens were collected from an area closer to the range of *P. vereschaginae* Casale than to that of *P. igori*. We do not include them in the type series, but also do not describe them as a distinct subspecies, because of an insufficient material.

Comparison. The new species is very close to *P. vereschaginae* Casale from the central part of Kirghizian Ridge, but differs well in the body shape: pronotum narrower at base, its hind angles not projecting laterally, its margins more narrowly flattened and more weakly reflexed, anterior angles less sharp and elytra more strongly narrowed to the less protruding shoulders.

Etymology. The species is named for Igor Belousov who collected the first specimen.

Pseudotaphoxenus kurdaiensis sp. n.
(Figs 2, 10-12)

Holotype. ♂, **Kazakhstan,** Kurdai, 10 km N of Georgievka, 14.VI.1981 (S. Ovchinnikov).

Description. Body 12.5 mm long, slender, convex; unicolorous, dark brown; elytra scarcely darker; palpi and 3 basal antennomeres reddish brown. Head oval; frontal furrows reaching anterior margin of eyes, oval, moderately deep, in shallow elongate wrinkles. Eyes large, convex; temples regularly curved with more or less sharp hind margin. Antennae of normal length, extending base of pronotum by their 3.5 segments. Pronotum elongate, 1.02 times as long as wide, widest in anterior third; 1.36 times wider than at base and 1.25 times wider than head with eyes. Its sides fluently curved forward and very weakly, but widely sinuated before hind angles, the latter scarcely sharp, obtuse at apex and protruded backwards; base sinuated; anterior margin almost straight; anterior angles short, but sharp, distance between them is the same as between hind angles. Disc weakly convex; lateral margin very narrow, weakly reflexed; basal foveae wide, without punctation, their outer margin arcuated, stretching forward almost to one third of pronotum, inner border not reaching median line, which is weakly depressed, not reaching anterior and posterior margins. Elytra strongly convex; 1.44 times as long as wide, 1.82 times wider than distance between humeral denticles and 2.51 times longer and 1.62 times wider than pronotum, widest behind middle; sides regularly rounded to shoulders; the latter rounded, with denticles not protruding out of general contour of elytra. Basal margin wide, weakly arcuate. Prescutellar pore present. Lateral emargination very wide, almost till shoulders, with narrowly reflexed bead. Disc weakly convex, basal foveae indistinct. Striae very fine, with traces of punctation. Intervals flat; series umbilicata with 21-33 pores; 3 preapical pores. Mesosternum before middle coxae with small acute tubercles. Legs of normal length, tarsal segments on upper surface with furrows almost till apex. First segment of hind tarsi with a few fine hairs. Microsculpture fine, isodiametric, causing weak shine of surface. Penis (Figs 10, 12) weakly and regularly curved, fluently narrowed to apex, lamella acute; right paramere as in Fig. 11.

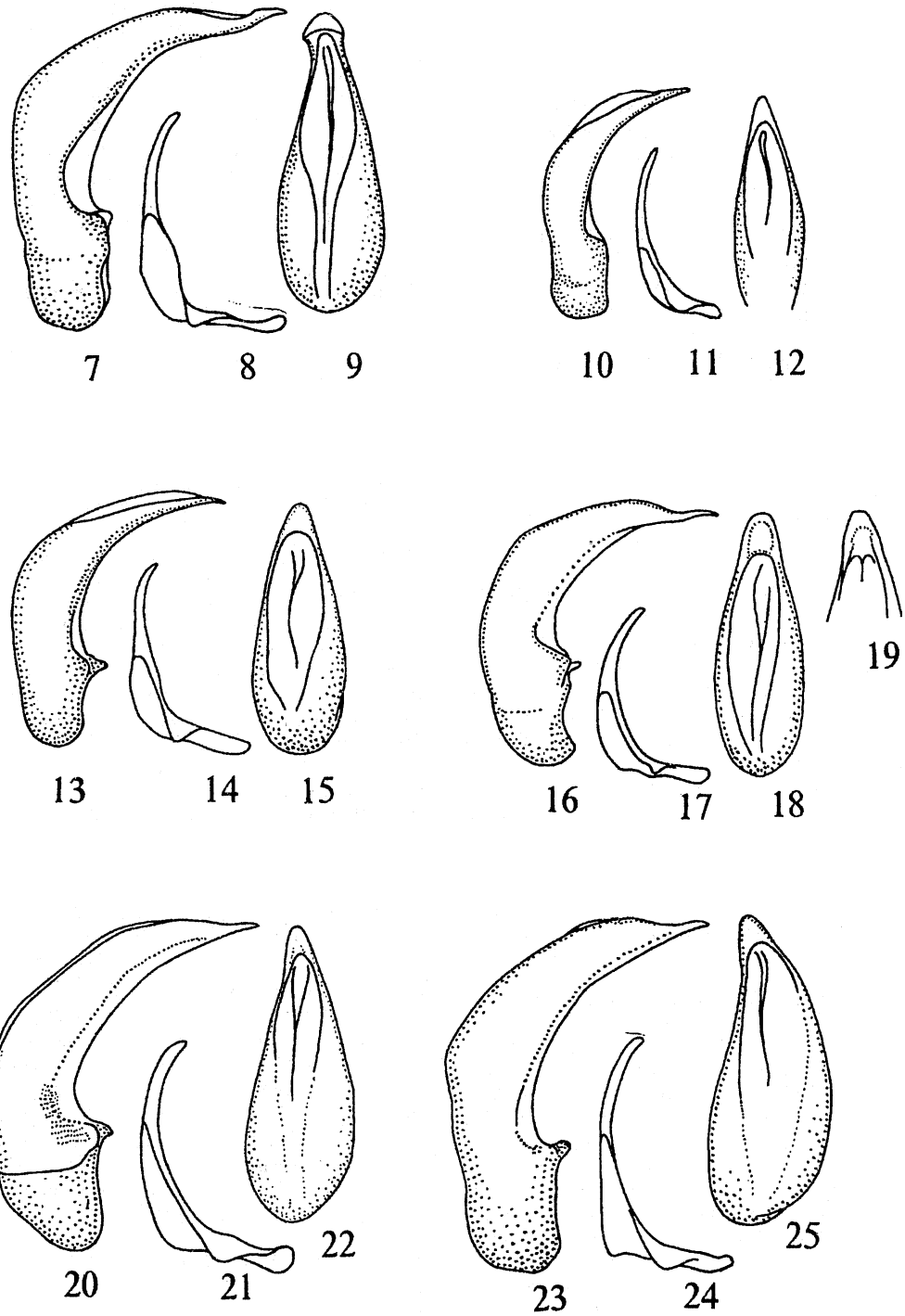
Comparison. This new species belongs to the *juvencus* species group sensu Casale (1988). It is very close to *P. michajlovi* (Vereschagina, 1988) distributed in the low mountains of Kugitang-tau, Aruktau, Baysuntau, Vachsh, Babatag and Zeravshan Ranges, so with a large gap to the south-west of Kurdai Pass. *P. kurdaiensis* easily differs from *P. michajlovi* in the more convex pronotum and elytra, more strongly protruded backward hind angles of pronotum, short elytra with flattened humeral denticles, very fine striae and very flat intervals. The penis of the new species is with less curved ventral margin and more acute lamella, than in *P. michajlovi*.

Etymology. The new species is named after the type locality, Kurdai Pass.

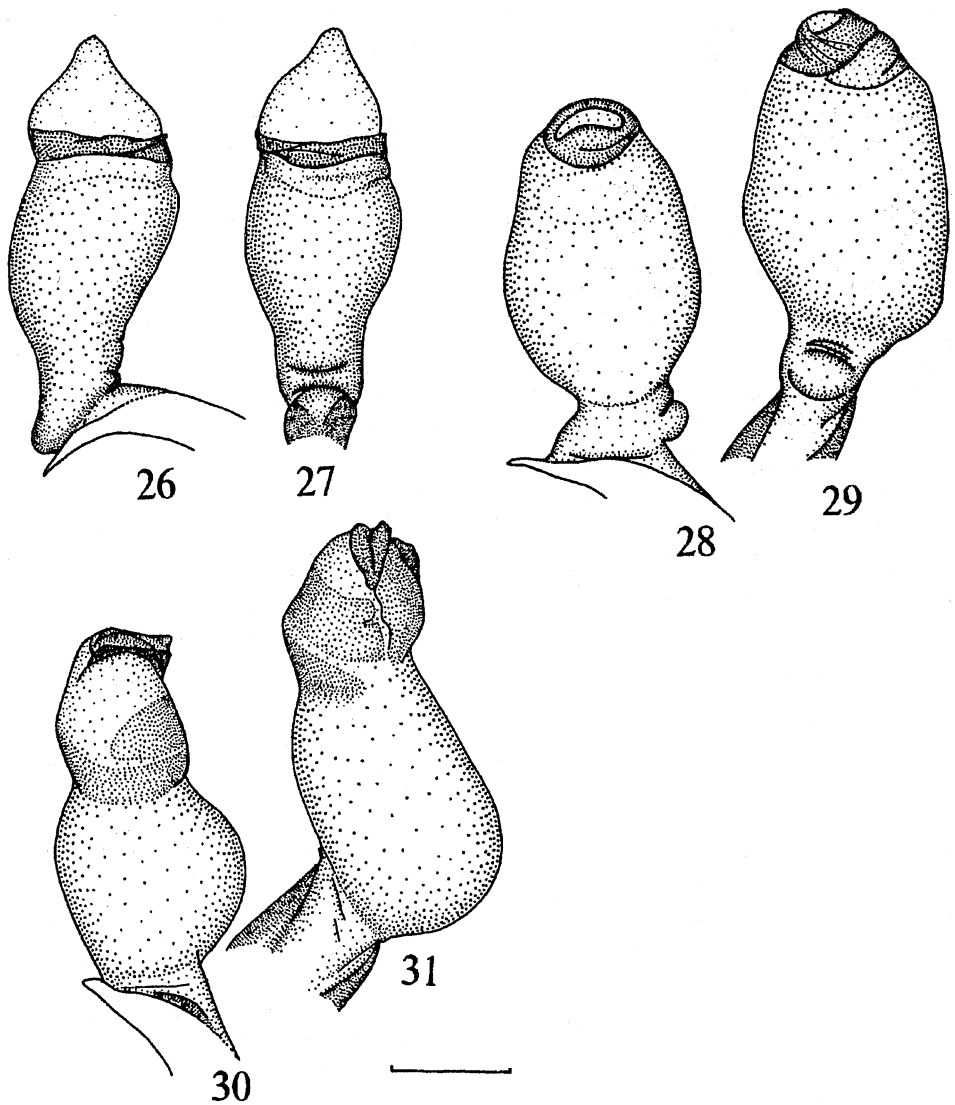
Pseudotaphoxenus ferghanensis sp.n.
(Figs 3, 13-15, 26, 27)

Holotype. ♂, **Kirghizia,** Dzhelal-Abad, 15.III.1993 (S. Ovchinnikov).

Paratypes. **Kirghizia:** 13 ♂, 9 ♀, same data as the holotype; 1 ♂, near Dzhelal-Abad, Suzak adyrs (dry foothills), 7.IV.1982 (S. Ovchinnikov); 2 ♂, 1 ♀,



Figs 7-25. *Pseudotaphoxenus*, penis and paramere. **7-9,** *P. igori* sp. n.; **10-12,** *P. kurdaiensis* sp. n.; **13-15,** *P. ferghanensis* sp. n.; **16-19,** *P. putshkovi* sp. n.; **20-22** *P. zvarici* sp. n.; **23-25,** *P. optatus* sp. n. 7, 10, 13, 16, 20, 23, penis, lateral view; 9, 12, 15, 18, 19, 22, 25, penis, dorsal view; 8, 11, 14, 17, 21, 24, right paramere.



Figs 26-31. *Pseudotaphoxenus*, inner sac turned out. **26, 27**, *P. ferghanensis* sp. n.; **28, 29**, *P. putshkovi* sp. n.; **30, 31**, *P. optatus* sp. n. 28-31, inner sac without distal part.

same locality, 10.IV.1982 (S. Ovchinnikov); 1 ♀, same locality, 5.IV.1988 (S. Zonstein); 1 ♀, bank of Kughart Riv., Ferghana, 8.V.1925 (Dobrzhansky). **Uzbekistan:** 1 ♂, Andyzhan adyrs, 4.IV.1988 (S. Ovchinnikov); 1 ♂, 1 ♀, "832", "Namangan Staud[inger] 86". **Tadzhikistan:** 1 ♂, Jantag, western spurs of Kuramin Ridge, 10.IV.1961 (I. Lopatin).

Description. Body 16.2-18.5 mm long, convex, subcylindrical; black brown, weakly shining; mandibles, palpi, antennae, tibiae, tarsi and underside of body paler. Antennae short, with about 1-2.5 segments reaching beyond base of pronotum; legs of normal length. Head comparatively wide, frontal foveae deep, wide, with fine, irregular furrows. Pronotum subcordate, a little wider than long, widest in anterior third. Pronotal sides weakly arcuately curved, before hind angles moderately sinuated. Anterior angles small; hind angles acute, slightly produced backward, their apices rounded; pronotal base weakly sinuated. Disc convex; median line fine, weakly depressed, in anterior half deepened, not quite reaching anterior margin, but the base. Side margin weakly raised and flattened. Basal foveae moderately deep, oval or weakly triangular. Middle part of

base with fine longitudinal furrows, without punctation. Disc along median line with fine transversal furrows; basal foveae weak, but distinct. Elytra oval, 1.5-2 times as long as wide, their maximum width near the middle or a little behind. Sides slightly arcuately converging forward and backward; humeral denticles rounded, weakly stretching out of the body contour. Basal bead moderately wide, arcuately narrowed to shoulders and scutellum. Prescutellar pore mostly absent. Disc strongly convex, without flattening along suture; basal foveae short, hardly distinguished. Side bead moderately narrowly flattened, of constant width or slightly narrowed near shoulders. Striae almost always very shallow; intervals flat. Series umbilicata with 23-27 pores; 2-3 preapical pores. Microsculpture fine, isodiametric, stronger on elytra. Tarsal segments on upper surface furrowed almost till apex; basal tarsal segment of hind legs with several deep pores. Penis (Figs 13, 15) curved ventrally, sharply narrowed to apex; lamella produced down from the upper side and almost straightly narrowed, moderately and narrowly rounded at apex. Right paramere (Fig. 14) dilated in middle part.

Ecological note. The species inhabits dry foothills (adyrs) in the east of Ferghana Valley.

Comparison. The new species belongs to the *juvencus* species group sensu Casale (1988). It differs from *P. stricticollis* Casale [described on 1 ♀ from Alai mountains (Uch-Kurgan) and distributed in the deserts of Turan from Repetek to south-eastern Balkhash], in the more convex and more cylindrical body, shape of pronotum, its sides sinuated before hind angles, which are weakly rounded and stretched backward; elytra less wide, with more developed shoulders, with weakly curved basal bead and shallow basal foveae; hair fringe on the apex of tarsal segments shorter. The new species easily differs from the close *P. lutshniki* (Jedl.) [described from Aulie-Ata (now Dzhambul) and distributed from northern Uzbekistan to Alakul and Issyk-Kul] in the more cylindrical body, wide and less cordate pronotum, less produced shoulders, denticles of which are more narrow, in shallow striae and flattened intervals of elytra, and shape of penis. From *P. juvencus* Ball. [distributed to the west and south-west from the area of the new species], it differs in the larger size, smaller eyes, more strongly developed anterior angles of pronotum, with smooth basal foveae, less produced shoulders, in wide and convex basal bead of more oval elytra, the side bead of which less flattened and striae very fine, and sharper lamella of penis.

Etymology. Named after the area where it was collected, Ferghana Valley.

Pseudotaphoxenus putshkovi sp. n.
(Figs 4, 16-19, 28,29)

Holotype. ♂, **Kirghizia**, Inner Tien Shan, Akshiyrak (Western) Range, Aldake Riv., S of Tshetki vill., 2500 m, 2.VII.1994 (A. Putshkov).

Paratypes. **Kirghizia:** 1 ♂, Fergana Range near Kazarman vill., 20.VI.1987 (Tschernyakhovsky); 1 ♂, southern slope of Atoynaksky Range near Kara-Kuldzha, Ak-Bulak-Kel, 19.V.1991 (I. Belousov); 7 ♂, 3 ♀, NW part of Ferghana Range, middle course of Karakol River, 26.IV.1992 (I. Belousov).

Description. Body 15.5-16.5 mm long, slender, flattened; black or almost black, underside of body, mandibles, palpi, antennae, tibiae, and tarsi brown. Head normally elongate; frontal foveae small, backward from antennal base very shallow, hardly distinguished. Eyes strongly, temples slightly convex, their hind margin distinct; two pairs of supraorbital setigerous pores. Antennae long, with about 3.5-4 segments reaching beyond the base of pronotum. Pronotum 1.02-1.04 times wider than long (its maximum width in the first quarter), 1.22-1.24 times wider than its base and 1.28-1.30 times wider than head with eyes. Anterior bead narrower than hind bead, anterior angles rounded, distinctly produced. Sides with very wide, but not deep foveae before hind angles, which are slightly acute, rounded at apex; base sinuate. Disc flat, median line strongly depressed, hardly reaching anterior and hind margins; lateral bead wide. Basal foveae deep, triangular, prolonged forward and to median line, without punctation. Elytra long, 1.65-1.76 times longer than wide, 2.78-2.79 times longer and 1.56-1.63 times wider than pronotum; their maximum width a little behind their middle; sides arcuately rounded to shoulders and apex. Disc slightly convex, interstriae narrowly flattened. Marginal bead beyond middle very wide, slightly narrowed to shoulders and apex, very weakly raised. Basal bead of elytra almost straight or slightly convex. Humeral denticles acute, rounded at apex. Prescutellar pores present. Depressions on every elytral base hardly marked. Striae fine, without traces of punctation; intervals flat. Series umbilicata with 20-30 pores; 1-2 preapical pores. Microsculpture of upper side fine,

producing mat appearance of the surface. Legs slender, tarsal segments with furrows; basal segment of hind tarsi without hairs. Penis (Figs 16, 18, 19) curved and narrowed to apex; lamella (Figs 18, 19) (in dorsal view) long, rounded. Inner sac (Figs 28, 29) with sharp tubercle near base; right paramere as in Fig. 17.

Comparison. The structure of lamella allows to put the new species to the *juvencus* species group sensu Casale (1988). The species is most closely related to *P. dignus* (Vereschagina, 1988), from which easily distinguished by the smaller size, darker colour and quite different form of pronotum. From *P. kulti* (Jedl.), it differs in the almost black colour, less curved basal bead of elytra, wide shoulders, shorter elytra with weak striae and more weakly raised sides of pronotum.

Etymology. Named for A.V. Putshkov, who collected one of the type specimens.

Pseudotaphoxenus zvarici sp. n.
(Figs 5, 20-22)

Holotype. ♂, **China**, *Qinghai*, Ngola Shan, 50 km SW of Hoka (280 km), 3600-4600 m, 16-22.VII.1994 (B. Zvaric), collection of B. Zvaric (Most).

Description. Body 15.1 mm long, moderately convex; black, head and pronotum with weak shine, elytra submat. Head moderately prolonged, mandibles narrow, weakly curved, short. Eyes large, longer than temples, convex, strongly inclined backwards. Frontal foveae long and wide, moderately deep, with several long and irregular furrows. Two pairs of supraorbital pores present. Antennae of moderate length, with about 2.5 segments reaching beyond base of pronotum. Pronotum cordate, 1.07 times wider than long, in the widest part 1.31 times wider than at base and 1.44 times wider than head with eyes. Maximum width of head in the first third. Pronotal sides arcuately converging anteriorly and posteriorly, with a sharp and comparatively short sinuation before hind angles, which are acute, rounded at apex, produced backward. Basal margin excised, front margin weakly convex, anterior angles obtuse, widely rounded, slightly produced, deflexed. Disc moderately convex; median line fine, very weakly depressed, shortened in front and not quite reaching basal margin; side bead narrow, weakly raised, widened near hind angles. Basal foveae in the form of short, deep, slightly oblique furrows, in small oval pits. Basal tranverse depression weakly oblique, extending forwards along median line. Basal surface of pronotum near middle with weak longitudinal furrows; disc with scarcely discernible long transverse furrows, more developed near median line and hind angles. Elytra oval, 1.56 times longer than wide, 1.55 times as wide as distance between humeral denticles, 2.54 times as long and 1.42 times as wide as pronotum; their maximum width in front of the middle. Sides rounded, shoulders straight, with strong and obtuse denticles at apex. Basal bead wide, narrowed to shoulders, but near denticles widened again and distinctly raised. Disc convex, not flattened along suture, striae fine, interstriae flat. Series umbilicata with 24-25 pores; 1 preapical pore. Microsculpture isodiametric on head, on pronotum very fine, consisting of weakly transverse meshes, on elytra deep, isodiametric, which causes their mat appearance. Legs comparatively short, tarsal segments on upper surface smooth. Penis (Figs 20, 22) wide, arcuately curved in distal quarter, regularly narrowed, narrowly rounded at apex, curved to the right (Fig. 22); right paramere as in Fig. 21.

Comparison. The species belongs to the *juvencus* species group. It is easily distinguished due to the small size and unusual appearance: small head with extended eyes and narrow, short and weakly curved mandibles, pronotum with small and sharp hind angles protruded backwards, and wide and oval elytra with straight shoulders. It is slightly resembling *P. kryzhanovskiji* Casale, from Ching-hai, but the body is wider, black, anterior angles of pronotum smaller, hind angles sharper, basal edge of elytra without punctation, penis less curved (lateral view), more narrowed to apex (dorsal view). The new species differs from *P. chinensis* (Jedl.), from Kansu, in the smaller body, black colour, narrow and short mandibles, strongly protruding eyes, produced hind angles of pronotum, straight humeral denticles, absence of punctation in elytral striae, narrow and asymmetrically curved penis. From *P. niger* Jedl. from Kansu, the new species differs in the smaller and wider body without brownish shine, in the narrow mandibles, protruding eyes, shoulders with more strongly developed denticles, more strongly curved basal edge of elytra, absence of prescutellar pore, narrow asymmetrical apex of penis. *P. zvarici* is close to *P. optatus* sp. n. in the character of the microsculpture causing mat appearance of elytra, convex eyes, cordate pronotum, black colour and struc-

ture of elytral striae. *P. zvarici* clearly differs in the slender body, narrow and short mandibles, weakly extended anterior angles and more acute hind angles of pronotum, aedeagus more strongly narrowed to apex, more strongly curved to the right, which causes its strong asymmetry.

Etymology. The species is named for Bogdan Zvaric (Most, Czech Republic), who has collected the type material.

Pseudotaphoxenus optatus sp. n.
(Figs 6, 23-25, 30, 31)

Holotype. ♂, **China**, *Qinghai* or. Anyemaqen Shan, 100 km SW of Heka, 8.VII.1992, 4700 m, L. Bieber leg.

Paratypes. 1 ♂, 2 ♀ with same data.

Description. Body 15-15.7 mm long, black, with opal shine; palpi, antennae and tarsi dark brown. Head oval, frontal foveae with fine transversal lines, eyes convex, temples oblique, flattened. Pronotum 1.05 times wider than long, narrowed to base, its widest part before middle, anterior angles extended, widely rounded. Side bead well developed; lateral margins regularly sinuated; hind angles weakly produced, acute, with setigerous pores on bead. Basal foveae distinct, with traces of punctation and fine furrows, base arcuate; median line deep, not reaching the base of pronotum. Elytra 1.5 times longer than wide, oval, widest almost at middle; marginal bead well developed. Striae fine, with punctation; intervals slightly convex. Microsculpture well developed, producing opal shine. Shoulders with prominent denticles; scutellar striae without basal pores; series umbilicata with 22-26 pores; 1-2 preapical pores. Middle tibiae of males weakly curved, with small fringe of thick golden hairs in the lateral apical part; upper surface of tarsi smooth, without furrows or punctation. Penis (Figs 23, 25) without apical disc, its apex weakly prolonged, right paramere as in Fig. 24. Inner sac as in Figs 30, 31.

Comparison. In the general habitus of body and form of penis, the new species is the most close to the *tashkensis* species group, but slender, pronotum more narrowed to base, eyes more convex and temples more srongly oblique, apex of penis wider and a little shorter than in *P. tashkensis* (Jedl.).

Etymology. Named because of the elegant body form.

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