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# Review of the *pumilus* group of *Harpalus* Latreille, 1802 from China, with description of a new species from Sichuan and Qinghai (Coleoptera: Carabidae: Harpalini)

# Обзор жужелиц группы *pumilus* рода *Harpalus* Latreille, 1802 Китая с описанием нового вида из Сычуани и Цинхая (Coleoptera: Carabidae: Harpalini)

**B.M. Kataev* & H.-B. Liang****
**Б.М. Катаев & Х.-Б. Лианг**

*Zoological Institute, Russian Academy of Sciences, Universitetskaya nab. 1, St.Petersburg 199034 Russia. E-mail: blaps@zin.ru
Зоологический институт Российской Академии Наук, Университетская наб. 1, Санкт-Петербург 199034 Россия.
**Institute of Zoology, Chinese Academy of Sciences, Beijing 100080 China. E-mail: lianghb@ioz.ac.cn

KEY WORDS: Coleoptera, Carabidae, *Harpalus*, *Actephilus*, the *pumilus* group, China, new species, distribution.

КЛЮЧЕВЫЕ СЛОВА: Coleoptera, Carabidae, *Harpalus*, *Actephilus*, группа *pumilus*, Китай, новый вид, распространение.

ABSTRACT. Eight species of the *pumilus* group of the genus *Harpalus* Latreille, 1802 known up to date from China is briefly reviewed, with description of a new species *H. minutulus* sp.n. from Sichuan and Qinghai Provinces (type locality: Dêgê County, Sichuan). *H. lutshniki* Schauberger, 1932 is recorded from China (Xinjiang Uygur Autonomous Region) for the first time. A key to all known species of the *pumilus* group is provided.

РЕЗЮМЕ. Приводится краткий обзор восьми видов жужелиц группы *pumilus* рода *Harpalus* Latreille, 1802, известных в настоящее время из Китая, с описанием нового вида из Сычуани и Цинхая (типовое место: Деге, Сычуань). *H. lutshniki* Schauberger, 1932 впервые указывается для Китая (Синьцзян-Уйгурский автономный район). Дан ключ для определения всех видов группы *pumilus.*

## Introduction

The species of the *pumilus* group (= *Actephilus* Stephens, 1833) of the genus *Harpalus* Latreille, 1802 are very similar in their appearance to each other and well recognizable from other groups by the small convex body with widely rounded basal pronotal angles, the short antennomeres and the unusual elytral chaetotaxy without parascutellar setigerous pore in most species. This moderately diverse group is distributed across Eurasia from Iberian Peninsula to Korea, with most species concentrated in semiarid areas of southern Siberia, Mongolia and China. The species of the *pumilus* group were revised by Kataev [1990] who treated within this group ten species, three of which (two from China) were newly described. Recent data on synonymy and distribution of all these species are summarized also in the Catalogue of Palaearctic Coleoptera [Kataev et al., 2003].

In late 2003, while sorting the collections of Harpalini in the Institute of Zoology, Beijing, China, we found interesting material of the *pumilus* group, including a new species from Sichuan and Qinghai, and its description is provided here. Because the fauna of China remains poorly known, a brief review of other Chinese representatives of the *pumilus* group is also given in the present paper. A revised key from Kataev [1990] to all known species of the *pumillus* group is also provided. In this key, most of the references to the illustrations, which were published in the latter paper [l. c.], are omitted, but in doubtful cases the illustrations of this paper must be consulted. Besides, since external distinctive characters used in the key are rather variable in some specimens, examination of male genitalia is very useful.

## Materials and methods

The following abbreviations were used herein for identification of deposition of the examined material: IZB — Institute of Zoology, Chinese Academy of Science, Beijing, China; ZISP — Zoological Institute, Russian Academy of Sciences, St.Petersburg, Russia; cIKAB — collection of I.I. Kabak (St.Petersburg, Russia); cWR — collection of D.W. Wrase (Berlin, Germany).

Measurements were taken as follows: body length from anterior margin of clypeus to elytral apex; width of head as maximum linear distance across head, including compound eyes, and as minimum linear distance across neck constriction just behind eyes; length of pronotum along its median line; length of elytra from basal ridge in scutellar region to apex of sutural angle; width of pronotum and elytra at their widest place.

The details of internal sac of aedeagus are lettered to correspond with Kataev [1990].

KEY TO SPECIES OF THE *PUMILUS* GROUP [MODIFIED FROM KATAEV, 1990]

1. Elytra each with a basal (parascutellar) pore at base of scutellar stria and at most one discal pore in middle portion of 3rd interval ..... *H. masoreoides* Bates, 1878
— Elytra lacking basal (parascutellar) pore. Third elytral interval with or without discal pores ..... 2
2. Protibia with strongly produced outer apical angle. Two penultimate abdominal sternites, except for two obligatory fixed setae, with several additional setae. Elytra without discal pores on 3rd interval ..... ..... *H. longipalmatus* Mordkovitsh, 1969
— Protibia without produced outer apical angle. Two penultimate abdominal sternite usually with only two obligatory fixed setae, rarely (in *H. sushenicus*) with several additional setae. Elytra with or without discal pores on 3rd interval ..... 3
3. Third elytral interval with two or three discal pores, at least on one elytron ..... *H. pusillus* (Motschulsky, 1850)
— Third elytral interval with one discal pore ..... 4
— Third elytral interval without discal pores ..... 7
4. Metacoxae each, except for two obligatory fixed setae, with one or two additional medial setae ..... ..... *H. pusillus* (Motschulsky, 1850)
— Metacoxae without additional medial setae ..... 5
5. Discal pore located in apical third of 3rd elytral interval. Body, on average, larger (5.4–6.3 mm), with relatively larger head ..... *H. alexandrae* Kataev, 1990
— Discal pore located in medial third of 3rd elytral interval. Body, on average, smaller (4.5–5.8 mm), with relatively smaller head ..... 6
6. Basal margin of elytra more strongly sinuate and meeting lateral margin at more or less distinct angle. Metafemur with usually five, more rarely four or six, setigerous pores along hind margin. Metepisterna, on average, longer; body broader and more convex. Aedeagus (see Kataev, 1990: figs. 43–44) with distinct right basal spiny patch 'F' in internal sac ..... *H. michaili* Kataev, 1990
— Basal margin of elytra much less strongly sinuate and arcuately curving inside shoulder up to lateral margin. Metafemur with usually 6–8, rarely five, setigerous pores along hind margin. Metepisterna, on average, shorter; body narrower and more flat. Aedeagus (see Kataev, 1990: figs 36–37) without right basal spiny patch 'F' in internal sac ..... *H. pusillus* (Motschulsky, 1850)
7. Metacoxae each, except for two obligatory fixed setae, with one or two additional medial setae ..... 8
— Metacoxae without additional medial setae ..... 10
8. Each of two penultimate abdominal sternites, except for two obligatory fixed setae, with several additional setae (often only two such setae present laterally, one on each side) ..... *H. sushenicus* Kataev, 1990
9. Aedeagus (see Kataev, 1990: figs 41, 42) with distinct left latero-medial spiny patch 'C' and distinct right basal spiny patch 'F' (see from dorsal side!). Body, on average, smaller (3.9–4.8 mm) and more convex. Pronotum relatively narrower, with more strongly rounded sides, particularly anteriorly. Microsculpture on pronotal and elytral discs usually obliterate .. *H. acupalpoides* Reitter, 1900
— Aedeagus (see Kataev, 1990: figs 36–37) without right basal spiny patch 'F' and usually without left latero-medial spiny patch 'C' (sometimes latter poorly recognizable as a tiny dark spot). Body, on average, larger (4.5–5.8 mm) and less convex. Pronotum relatively broader, with less strongly rounded sides. Microsculpture on pronotal and elytral discs distinct, isodiametric ..... ..... *H. pusillus* (Motschulsky, 1850)
10. Metepisterna shorter and broader, their length along inner margin approximately equal to their width along anterior margin ..... 11
— Metepisterna longer and narrower, their length along inner margin notably greater than their width along anterior margin ..... 13
11. Humeri each with distinct denticle at apex (see from behind!). Aedeagus with large apical tooth in internal sac ..... 12
— Humeri without denticle at apex. Aedeagus without tooth in internal sac (Figs 6–7) ..... *H. minutulus* sp.n.
12. Humeral denticle larger, rather prominent. Outer distal margin of protibia with 4–5 spines. Hind margin of metafemur with 5–7 setigerous pores. Body, on average, larger and relatively broader (length 5.4–6.6 mm, width 2.6–8.0 mm). Dorsal microsculpture more distinct ..... ..... *H. picipennis* (Duftschmid, 1812)
— Humeral denticle smaller, not or only scarcely prominent. Outer distal margin of protibia with three (rarely four) spines. Hind margin of metafemur with four (rarely five) setigerous pores. Body, on average, smaller and relatively narrower (length 5.2–6.4 mm, width 2.2–2.7 mm). Dorsal microsculpture less distinct, in male often obliterate on frons, vertex and pronotal disc ..... ..... *H. pumilus* Sturm, 1818
13. Each of two penultimate abdominal sternites, except for two obligatory fixed setae, with several additional setae (often only two such setae present laterally, one on each side) ..... *H. sushenicus* Kataev, 1990
— Each of two penultimate abdominal sternites only with two obligatory fixed setae ..... 14
14. Outer distal margin of protibia with usually three, more rarely four spines. Elytra relatively longer. Aedeagus (see Kataev, 1990: figs 34, 35) lacking basal spiny patch 'F' and right apical spiny patch 'D' ..... ..... *H. lutshniki* Schauberger, 1932
— Outer distal margin of protibia with 4–6 spines. Elytra relatively shorter. Aedeagus with right spiny patch 'D' and sometimes basal spiny patch 'F' ..... 6

## *Harpalus minutulus* **sp.n.**

Figs 1–7.

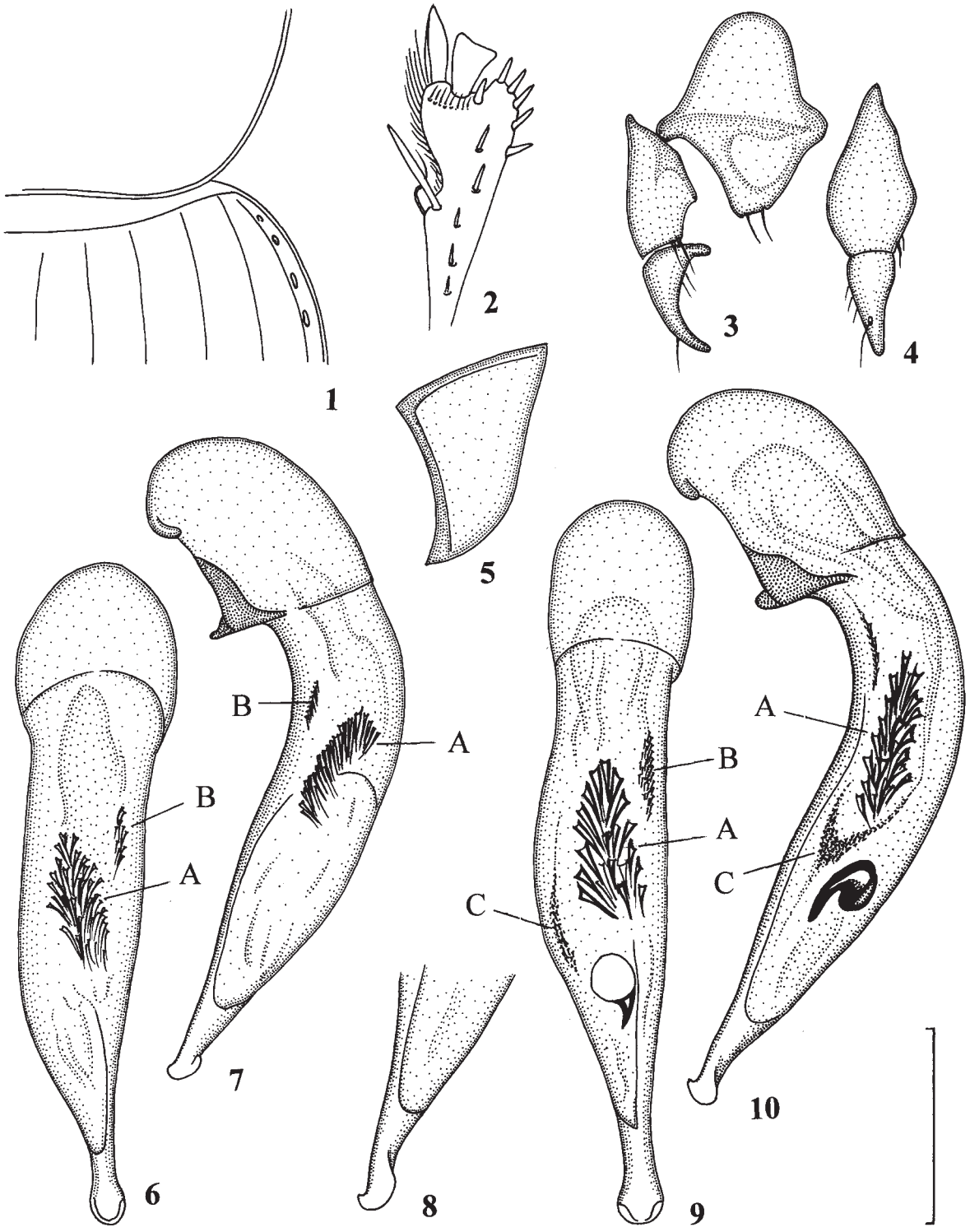
Holotype. **China**: 1 ♂, SICHUAN, Dêgê Co., 3200 m, 4.VII.1983, Chen Yuanqing leg. (IZB).

Paratypes. SICHUAN: 1 ♀, same data as holotype (ZISP); 1 ♂, 1 ♀, Dêgê Co., 3100−3300 m, 4.VII.1983, Niu Chunlai leg. (IZB; ZISP); 1 ♀, Luding, 1230 m, 4.VII.1983, Wang Shuyong leg. (IZB); 1 ♂, Garzê Co., 3400 m, 21.VI.1983, Wang Shuyong leg. (IZB); 1 ♀, Batang Co., 3470 m, 16.VIII.1982, Wang Shuyong leg. (IZB). Qinghai: 1 ♀, Yushu Co., 3900 m, 24.VII.1964, Wang Shuyong leg. (IZB).

DESCRIPTION. Body length 4.5–5.8 mm, width 1.8–2.6 mm (in holotype 4.6 and 2.0 mm, respectively).

Dark brown to black, mat or only slightly shiny on dorsum; apices of palpi, antennae basally and apically, tibiae basally and tarsi usually paler, brown or brownish yellow.

Head of medium size, measured across eyes and across neck constriction, correspondingly 0.61–0.67 and 0.50–0.57 times as wide as pronotum (these indices respectively 0.61–




Figs 1–10. *Harpalus* spp.: 1–7 — *H. minutulus* sp.n., 8–10 — *H. masoreoides*. 1 — right basal angle of pronotum and humer; 2 — left protibia, ventral aspect; 3 — left hemisternite and stylus, ventral aspect; 4 — left stylus, lateral aspect; 5 — left metepisternon; 6, 9 — median lobe of aedeagus, dorsal aspect; 7, 10 — same, lateral aspect; 8 — apical part of median lobe, lateral aspect. A — medial spiny patch; B — right latero-medial spiny patch; C — left latero-medial spiny patch. Scale = 0.5 mm.

Рис. 1–10. *Harpalus* spp.: 1–7 — *H. minutulus* sp.n., 8–10 — *H. masoreoides*. 1 — правый основной угол переднеспинки и плечо; 2 — левая передняя голень, вентральный вид; 3 — левый полустернит и стилюс, вентральный вид; 4 — левый стилюс, вид сбоку; 5 — левый метэпистерн; 6, 9 — срединная доля эдеагуса, дорсальный вид; 7, 10 — то же, вид сбоку; 8 — апикальная часть срединной доли эдеагуса, вид сбоку. A — медиальное шипоносное поле; B — правое латеро-медиальное поле; C — левое латеро-медиальное поле. Масштаб 0,5 мм.

0.62 and 0.50–0.53 in males, and 0.63–0.67 and 0.53–0.57 in females). Eyes moderately convex, slopingly descending to neck, separated ventrally from buccal fissure by a distance scarcely shorter than width of 1st antennomere. Tooth of mentum well developed, acute. Antennae short, markedly not reaching pronotal base; antennomeres 4–11 approximately as long as wide. Dorsal microsculpture obliterate but visible throughout; meshes isodiametric.

Pronotum convex, not depressed basally and laterally, 1.48–1.55 times as wide as long, widest approximately at middle, just after lateral setae. Sides throughout evenly rounded, almost equally converging basally and apically. Apical margin arcuately emarginate and apical angles slightly protruding anteriad; basal margin straight or very broadly rounded medially. Both apical and basal angles rounded at apex, but basal one much more widely (Fig. 1). Basal foveae very small and shallow, often isolated from basal margin by convexity. Pronotal surface, including area within basal foveae, impunctate. Basal pronotal edge ciliate. Microsculpture visible throughout; meshes distinct, isodiametric.

Elytra convex, 1.31–1.43 times as long as wide, 2.37–2.52 times as long and 1.14–1.24 times as wide as pronotum, rounded at sides and widest at middle. Humeri (Fig. 1) rounded at apex and lacking any denticle. Subapical sinuation weak, without denticle at base. Sutural angle nearly rectangular, rather sharp at apex. Basal edge of elytra glabrous, sinuate and arcuately curving inside shoulder up to lateral margin. Striae impunctate, superficial or slightly impressed throughout. Scutellar stria present, without basal pore. Intervals somewhat flat, impunctate. Third interval without discal pores. Microsculpture distinct throughout, consisting of isodiametric meshes.

Brachypterous; hind wing reaching at most half of elytron. Metepisterna (Fig. 5) comparatively short, notably narrowed posteriad, their width along anterior margin approximately equal to their length along inner margin. Three last abdominal sternites glabrous, only with obligatory fixed setae. Anal sternum rounded at apex in both sexes. Protibia (Fig. 2) notably widened and flattened apically, without produced outer apical angle, with four, rarely five, spines on outer distal margin isolated from spines on ventral side of tibia and with one ventroapical spine. Metacoxae without additional setigerous pores. Metafemora each with usually four, rarely five, setigerous pores along posterior margin and with 2-4 pores along anterior margin apically.

Median lobe of aedeagus (Figs 6–7) curved almost just after basal bulb, with more or less straight apical portion (lateral aspect). Terminal lamella much longer than wide, rather narrow, slightly widened apically (dorsal aspect) and with oblique horseshoe-shaped apical capitulum. Internal sac with only large medial spiny patch 'A' and small right lateromedial spiny patch 'B'; large apical tooth, characteristic of all other species of the *pumilus* group, absent.

Female genitalia (Figs 3–4) with rather short and broad basal stylomere and moderately curved apical stylomere; latter with several thin setae on external margin.

DISTRIBUTION. The new species is known from the north-western portion of Sichuan and the southern portion of Qinghai. It seems to be allopatric to all the other species of the *pumilus* group.

REMARKS. The exact position of *H. minutulus* sp.n. amongst the other members of the *pumilus* group is not entirely known. It is well differ from all the other species of this group by absence of large apical tooth in the internal sac of aedeagus. In appearance, the new species is rather similar to *H. alexandrae*, also distributed in Sichuan, but easily distinguished from it by the elytra without discal pore on third interval. In some characters (third elytral interval lacking discal pore, metacoxae without additional setigerous pores and short metepisterna), *H. minutulus* sp.n. is similar to *H. pumilus* but differing in the rounded humeri without any denticle at apex.

ETYMOLOGY. The species name refers to small body size of this taxon.

### *Harpalus alexandrae* Kataev, 1990

DISTRIBUTION. This species is known only from the type series collected in central Sichuan (Kangding District: Dadu He and Xiaojin He Valleys) by the Russian explorer of Central Asia G.N. Potanin in 1893 (Type locality: "Tun [= Dadu He] River Valley"). There are no new records.

REMARKS. *H. alexandrae* is a single known species of the *pumilus* group with discal pore located in the apical third of the third elytral interval. In other species, one or two discal pores, if present, are located in the middle portion of third interval.

### *Harpalus pumilus* Sturm, 1818

DISTRIBUTION. This species is widely distributed across the western Palaearctic from Iberian Peninsula to southern Siberia and Tien Shan. In China *H. pumilus* is known only from Xinjiang Uygur Autonomous Region. Formerly, it was recorded from several localities within Yining County in the northwestern part of the Region: Gulja (= Yining), Ili He Valley to west of Gulja, and "Achal"on southern slopes of Borohoro Shan (Kataev, 1990).

NEW MATERIAL FROM CHINA. XINJIANG: 1 ♀, Altay County, 1050 m, 10.VIII.1960, Wang Shuyong leg. (IZB).

REMARKS. Like most other members of the *pumilus* group, *H. pumilus* is characterized by the absence of parascutellar pores on elytra, but we have examined an aberrant specimen (male) from Kirghizia [30 km N Frunze (= Bishkek), Chon-Aryk, 12–13.VI.1982, J. Odehnal leg. (ZISP)] which possesses a parascutellar pore on the left elytron (such pore is absent on the right elytron). Genitalia of this male are not dissimilar to those of other specimens of *H. pumilus*.

### *Harpalus masoreoides* Bates, 1878
Figs 8–10.

DISTRIBUTION. This species is rather common in mountain regions of the Middle Asia (Saur, Tarbagatay, Dzhungar Alatau, Tien Shan, Alai, East Pamir and West Kunlun) reaching the Mongolian Altai in the east [1 ♂, Mongolia: Kobdo (=Hovd) Aimak, Ulyastayn-Gol, 20 km N of Bulgan, 31.VI.1980, G. Medvedev leg. (ZISP)]. In China *H. masoreoides* is distributed within Xinjiang Uygur Autonomous Region.

NEW MATERIAL FROM CHINA. XINJIANG: 15 ex. (♂ and ♀), Hejing Co., Balguntay, 2350 m, 1960, Wang Shuyong leg. (IZB); 1♂, Wensu Co., 1930 m, 15.VI.1978, Zhang Xuezhong leg. (IZB); 1 ♂, Akto Co., 3000 m, 25.VI.1987, Zhang Xuezhong leg. (IZB); 1 ex, S Bogda Shan Mt. R., N of Dabancheng, 13.VII.1993, E. Giacomazzo leg. (cWR); 1 ♂, S slope of Tien Shan, road Kuga – Bayanbulak, ca 100 km NNE Kuga, 2000–3000 m, 1993, J. Turna leg. (cWR); 2 ♂♂, 4 ♀♀, Karlyktag Mt. R., Tumurty River, 3 km above of Ergaity village, 1850 m, 16.VII.1999, I. Belousov & I. Kabak leg. (ZISP); 1 ♂, S slope of east part of East Tien Shan, right bank of right tributary of Bogdan-Gol River, WNW Balguntay, 2800 m, 8.VII.2001, I. Kabak leg. (cIKAB); 1 ♂, upp.

Kucha, left bank, 42°22′00″N 83°16′35″E, 2200 m, 8.VI.2002, I. Kabak leg. (cIKAB); 1 ♂, SW slope of Megin-Ula, NE Balfangou, 43°43′30″N 93°30′00″E, 2250–2450 m, 16.VI.2002, I. Kabak leg. (cIKAB); 1 ♂, 2 ♀♀, left bank of Agiaz, 5 km W of mouth of Kaptyksu, 2400 m, 42°34′25″N 81°16′00″E, 30.VII.2003, I. Kabak leg. (cIKAB); 2 ♂♂, Taxkorgan Co., 5.VII.1987, Zhang Xuezhong leg. (IZB).

REMARKS. *H. masoreoides* is a single species of the *pumilus* group with a parascutellar pore on each elytron. In most cases, by this character it is easily distinguished from all the other species of this group, but in two males examined from Taxkorgan County, Pamir, China (see material listed above) parascutellar pore is present only on one elytron in one specimen. Since in other characters, including the aedeagus (Figs 8–10), these specimens are identical to the specimens collected in other localities, they apparently belong to the same species. Notable difference in position of apical capitulum of aedeagus between both males from Taxkorgan (Figs 8 and 10) is within the individual variability of *H. masoreoides*; notice that there are no remarkable differences between these males in the armature of internal sac.

### *Harpalus lutshniki* Schauberger, 1932

DISTRIBUTION. This rather rare species is sporadically distributed across Eurasian steppe and forest steppe zones from the Lower Volga to Baikal Lake occurring also in the mountain regions of eastern Kazakhstan (Saur, Tarbagatay, Dzhungar Alatau, Transili Alatau). Ovchinnikov [1996] reported this species from northern Kirghizia. Formerly *H. lutshniki* was not recorded from China.

NEW RECORD. **China**. XINJIANG: 1 ♂, 1 ♀, W part of Urkashar Mountain Range, right bank of Kyzylsay River, 2000 m, 46°23′30″N 84°04′36″E, 6.VIII.2003, I. Kabak leg. (cIKAB; ZISP).

REMARKS. Within the *pumilus* group, this species is characterized by the longest metepisterna which, measured along inner and anterior margins, about 1.5 times as long as wide.

### *Harpalus acupalpoides* Reitter, 1900

DISTRIBUTION. *H. acupalpoides* is known from southern Siberia (Russia: Tuva, Buryatia, Chita Province), Mongolia and China (Qinghai and Gansu Provinces).

NEW MATERIAL FROM CHINA. QINGHAI: 1 ♂, Guinan Co., 3200 m, 13.VI.1957, Zhang Yiran leg. (IZB); 2 ♂♂, 1 ♀, Gonghe Co., 6.IX.1959, no collector (IZB).

### *Harpalus longipalmatus* Mordkovitsh, 1969

DISTRIBUTION. This species is distributed in Russia across southern Siberia from Khakassia to Amur Province, in eastern Mongolia, northern Korea and northeastern part of China (Liaoning and Heilongjiang Provinces).

NEW MATERIAL FROM CHINA. **China**. LIAONING: 2 ♂♂, 6 ♀♀, Zhanggutai, 42°42′N 122°29′E, 1.IV.1958, Huang Fusheng leg. (IZB); 1 ♂, Zhanwu Co., 19.V.1956, no collector (IZB); HEILONGJIANG: 1 ♀, Tailan Co., 46°23′N 123°27′E, 21.VI.1970, no collector (IZB); 1 ♂, Harbin, no collector (IZB).

REMARKS. This species is easily recognizable from all the other species of the *pumilus* group by the protibia with strongly produced outer apical angle. Besides, its two penultimate abdominal sternites, except for two obligatory fixed setae, possess also several additional setae.

### *Harpalus sushenicus* Kataev, 1990

DISTRIBUTION. *H. sushenicus* seems to be endemic to China. Originally, it has been described from the series collected in Heilongjiang and Liaoning Provinces (type locality: Maqiaohe near Taiping Ling, Heilongjiang Province). According to the new records, this species is rather widely distributed over the northeastern provinces of China: Inner Mongolia, Shanxi, Heilongjiang, Jilin, Liaoning, Hebei and Beijing.

NEW MATERIAL. **China**. INNER MONGOLIA: 1 ♀, Jirem Meng, Hure Qi, 19.VII.1987, Baoshan leg. (IZB). SHANXI: 1 ♀, Fenyang Co., 3.VII.1990, Jiři Moravec leg. (cWR). HEBEI: 1 ♂, Yuxian Co., Baile T., 39°58′N 114°52′E, 3.VIII.1964, Han Yinheng leg. (IZB). BEIJING: 1 ♀, "Peiping, Hopei", 2.VII.1938, T.P. Chang leg. (IZB); 1 ♂, 1 ♀, "Peiping", 14.III.1936 and 4.VI.1937, T.P. Chang leg. (IZB); 1 ♂, same locality, 16.IV.1937, T.P. Chang leg. (IZB).

REMARKS. Like the preceding species, *H. sushenicus* has additional setae on abdominal sternites but outer apical angle of its protibia does not produced. By these characters it may be distinguished from the related species.

NOTE. Probably will be found in China also: *H. pusillus* (Motschulsky, 1850) and *H. michaili* Kataev, 1990. Both are rather widely distributed over southern Siberia and Mongolia and found near the Chinese boundary.

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