Entomological Problems, 30 (2): 67-83, December 1999

Four new species of carrion beetles from China (Coleoptera: Silphidae)

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HÁVA, J., SCHNEIDER, J. & RŮŽIČKA, J. 1999. Four new species of carrion beetles (Coleoptera: Silphidae) from China. *Entomol. Probl.* 30(2): 67–83. – The following new species of carrion beetles are described, illustrated and compared with similar species. *Ptomascopus zhangla* sp.nov. (China: Gansu prov., Shaanxi prov., Sichuan prov.) differs from *P. morio* KRAATZ, 1877 and *P. plagiatus* (MÉNÉTRIÉS, 1854) by the presence of curved, fossorial legs; mesh of randomly oriented cristae on head and pronotum, oriented to all directions; male clypeal membrane short, transverse; pronotum bicoloured, bare; tarsal empodium trisetose; and female tergum X bifurcate. *Nicrophorus smefarka* sp.nov. (China: Sichuan prov.) seems not to be closely related to any known species of the genus, although it shares some characters with *N. dauricus* MOTSCHULSKY, 1860 and *N. przewalskii* SEMENOW, 1894 (such as setation of dorsum and maculation) but differs in anteriorly narrow pronotum. *Silpha businskyorum* sp.nov. (China: Shaanxi prov.) belongs to the group of species related to *S. carinata* HERBST, 1783 and differs in having only a very superficial, hardly visible discal punctation on pronotum; elytra distinctly vaulted in lateral view; and the distal part of aedeagus abruptly narrowing to regularly rounded tip. *S. schawalleri* sp.nov. (China: Sichuan prov.) is closely related to *S. qinlinga* SCHAWALLER, 1996 and differs in head with raised protuberance; pronotum with flattened lateral margin; elytra laterally narrow and only slightly elevated, all elytral ridges only weakly indicated; and aedeagus with robust basal portion and with wide, regularly tapered tip.

Key words: Taxonomy, new species, Coleoptera, Silphidae, *Nicrophorus*, *Silpha*, *Ptomascopus*, China.

Introduction

Silphids are a small group of ca. 200 species worldwide (NEWTON 1991). They are mostly necrophagous both as adults and larvae, with a small portion of species being carnivorous or phytophagous (ANDERSON & PECK 1985). The highest number of species is known from the Eastern Palaearctics and many species are only poorly known (PORTEVIN 1926; SHCHEGOLEVA-BAROVSKAYA 1933; SCHAWALLER 1981; LAFER 1989).

China is a country with a very complicated geography, resulting in a high biodiversity in many groups and with a high proportion of endemic species (e.g., ZHAO & ADLER 1993; JÄCH & JI 1995). This is true also for Silphidae, despite our inadequate knowledge of many regions and correspondingly sparse distributional records of most Chinese species. A review of papers with basic information and recent records is given by RŮŽIČKA & SCHNEIDER (1996). In the present paper we provide the descriptions of four new species, collected recently by Czech and German entomologists in the Chinese provinces of Gansu, Shaanxi and Sichuan (Fig. 44).

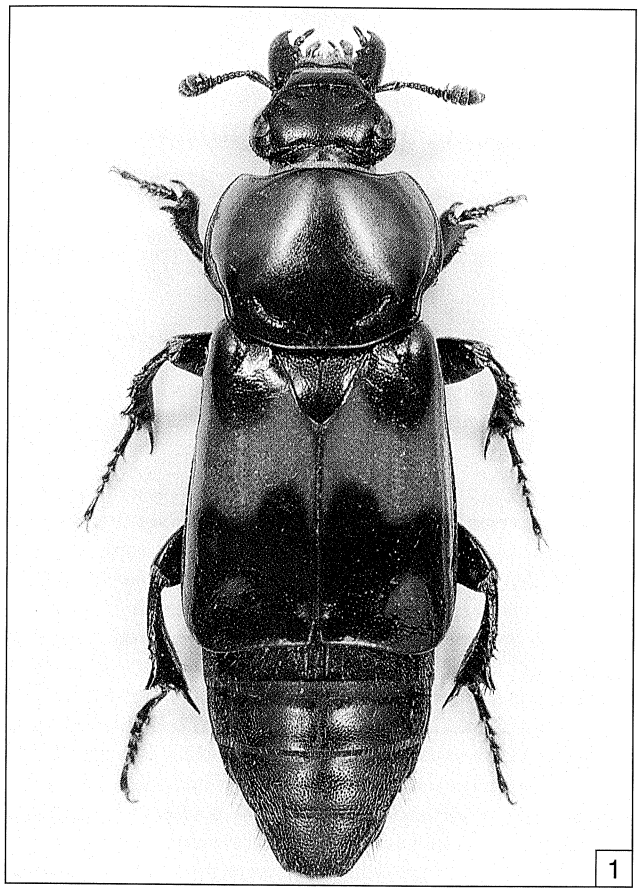
Material and Methods

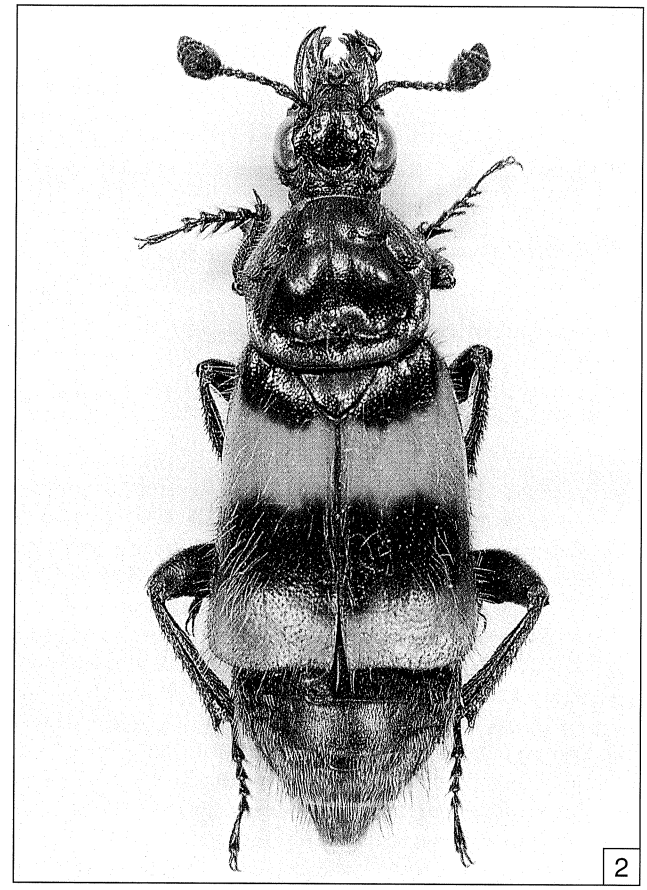
The following abbreviations of collections are used throughout the text:

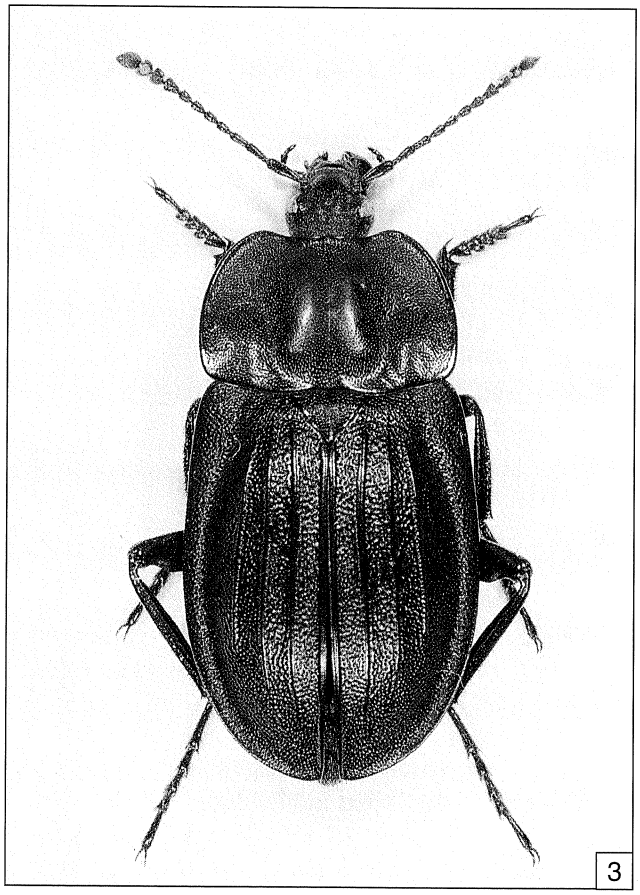
JHAC - coll. J. Háva, Praha
JRUC - coll. J. Růžička, Praha
JSCC - coll. J. Schneider, Praha
JZIC - coll. J. Zídek, Praha
NKME - Naturkundemuseum, Erfurt
NMPC - Národní muzeum, Praha
SMNS - Staatliches Museum für Naturkunde, Stuttgart
VBEC - coll. V. Beneš, Praha
ZMHB - Museum für Naturkunde der Humboldt-Universität, Berlin

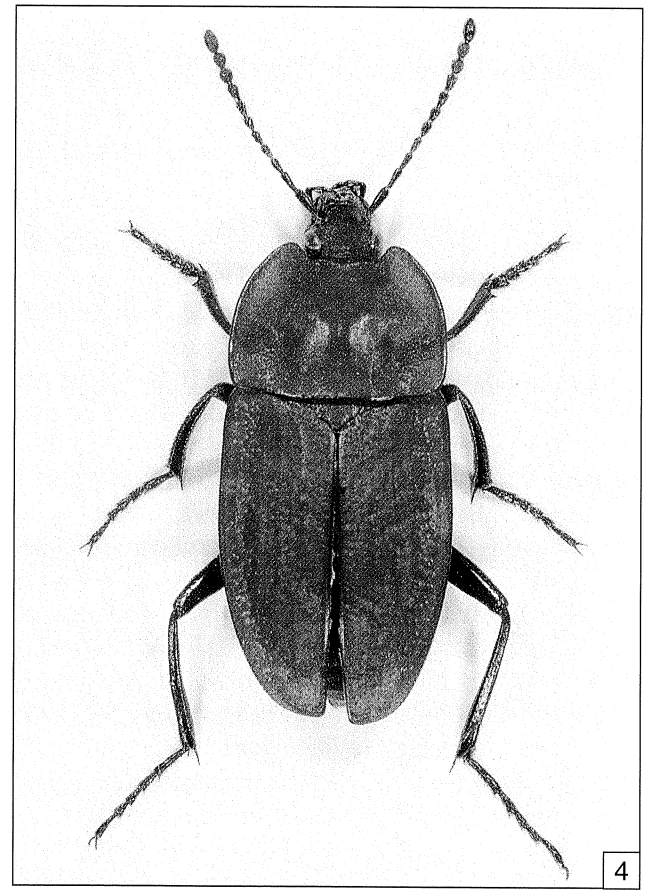
Holotype specimens, presently in JHAC and JSCC will be deposited in NMPC.

All type material has additionally a red, printed label with text as follows: "HOLOTYPUS [or ALLOTYPUS, PARATYPUS, respectively] *genus_name species_name* sp.nov. Jiří Háva, Jan Schneider & Jan Růžička det. 1997 [or 1998]".

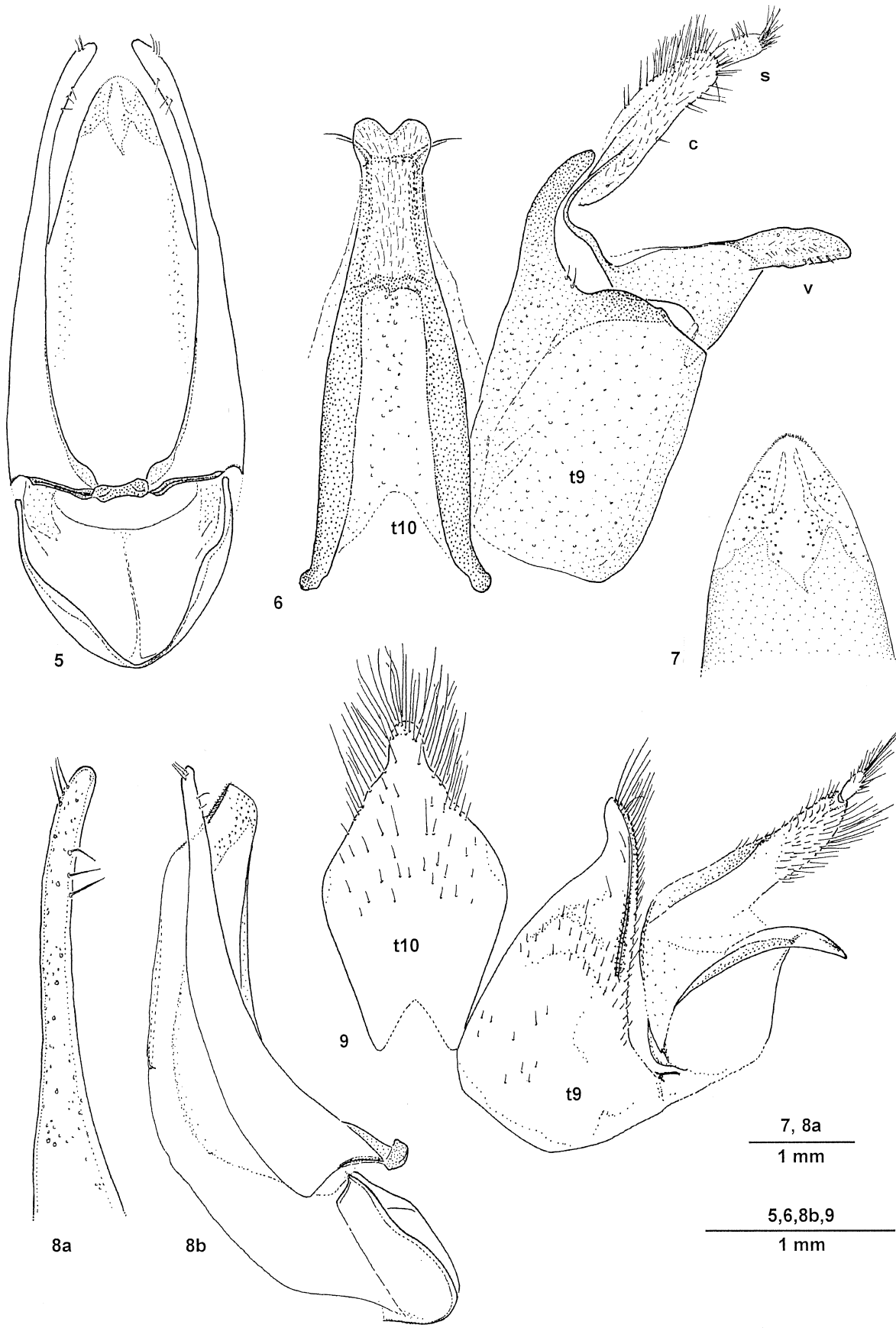




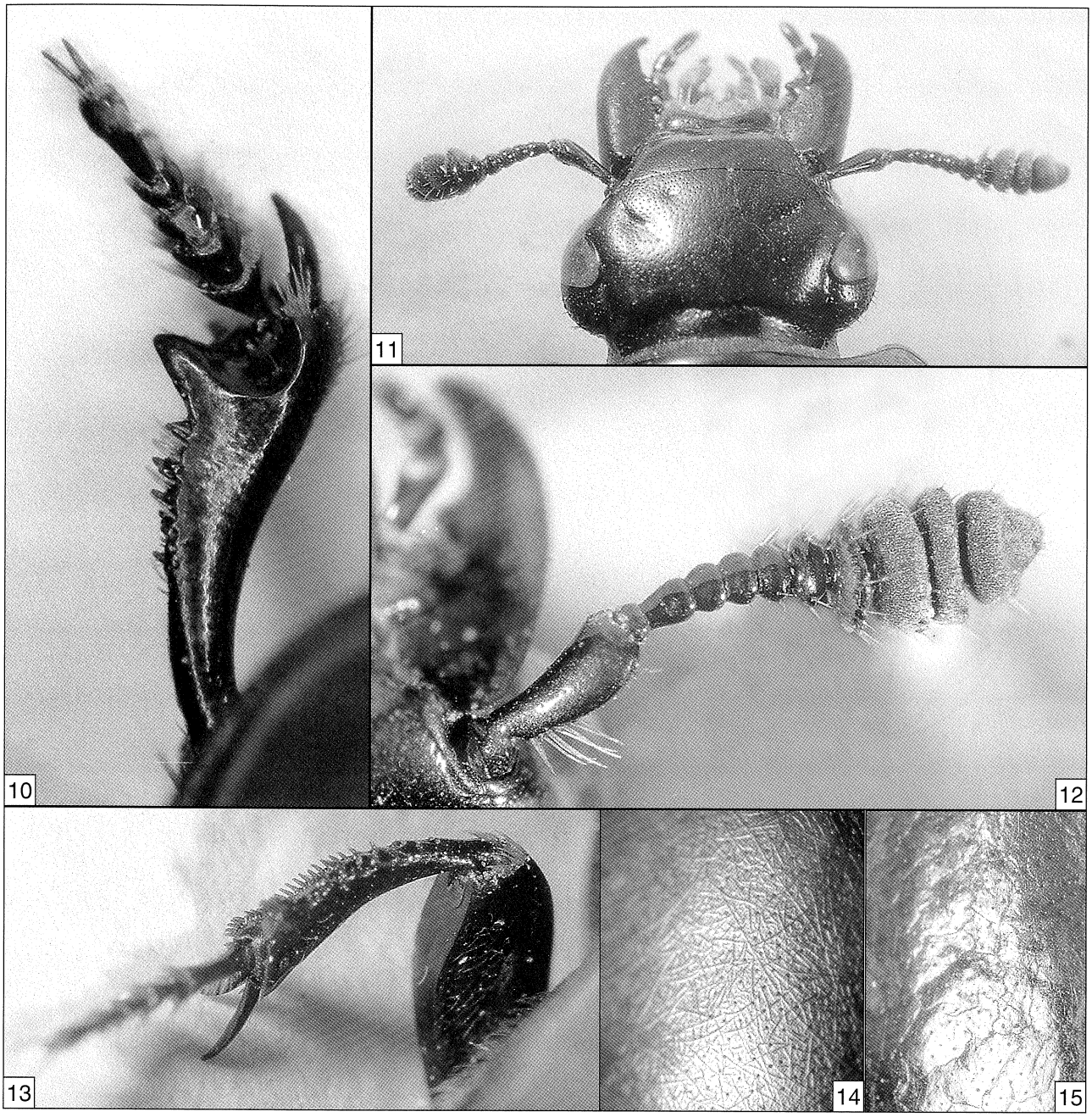




Figs 1 – 4 Habitus dorsally: 1) *Ptomascopus zhangla* sp.nov. (holotype male, length 18,4 mm); 2) *Nicrophorus smefarka* sp.nov. (holotype female, length 18.4 mm); 3) *Silpha businskyorum* sp.nov. (holotype male, length 17.9 mm); 4) *Silpha schawalleri* sp.nov. (paratype male, length 13.0 mm).



Figs 5 – 9. 5, 7, 8a, 8b: *Ptomascopus zhangla* sp.nov., holotype male: 5) aedeagus ventrally; 7) tip of aedeagus ventrally; 8a) paramere in ventro-lateral view; 8b) aedeagus laterally; 6) *P. zhangla* sp.nov., allotype female, genitalia dorsally; 9) *Nicrophorus smefarka* sp.nov., holotype female, genitalia dorsally (t 9 – left part of tergum IX, t 10 – tergum X, v – left valvifer, c - left coxite, s – left stylus).



Figs 10 – 15 *Ptomascopus zhangla* sp.nov., holotype male: 10) left protibia and protarsus dorsally; 11) head dorsally; 12) right antenna dorsally; 13) left mesotibia and mesotarsus postero-laterally; 14) detail of pronotal surface dorso-laterally; 15) detail of elytron dorso-laterally.

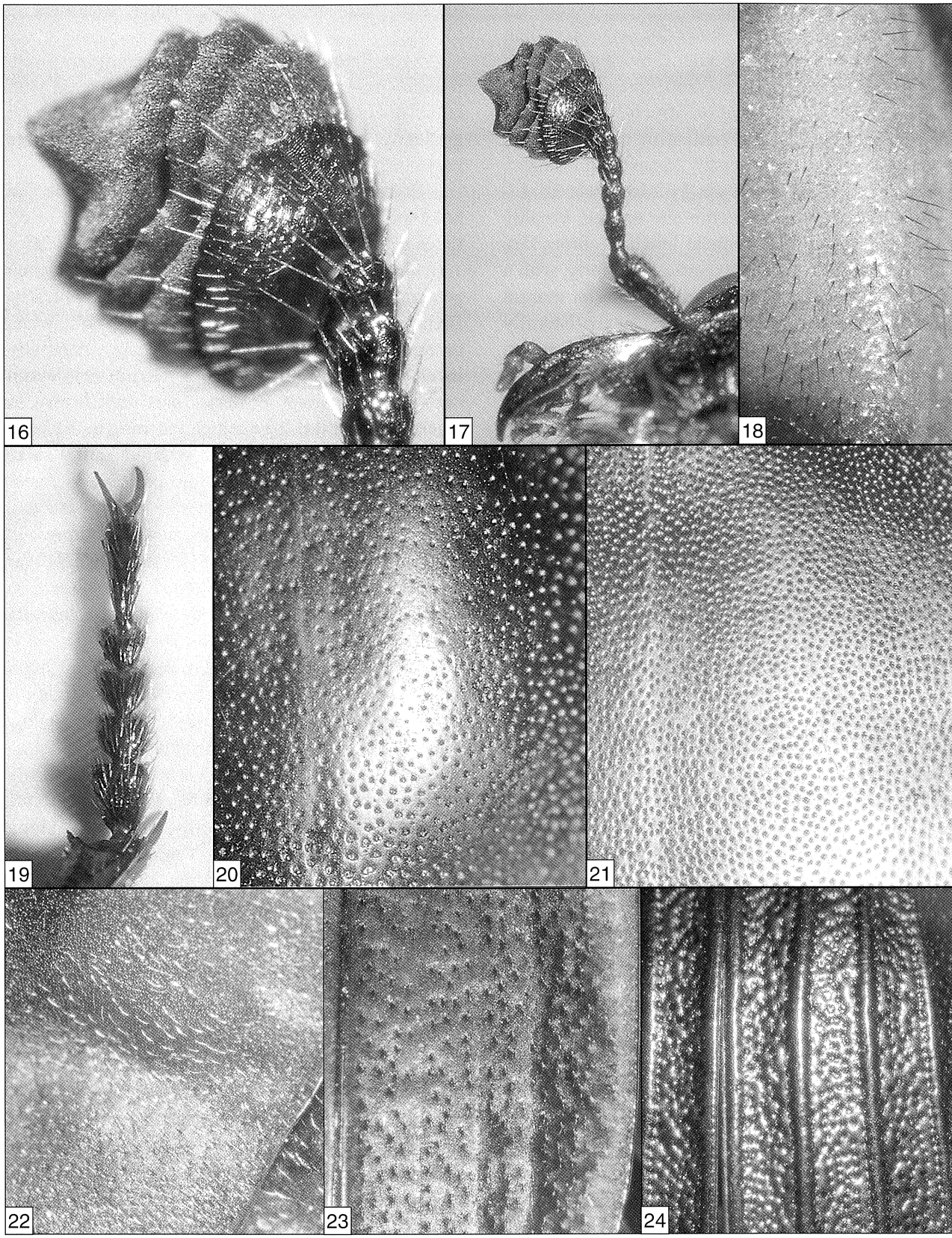
Taxonomy

Ptomascopus zhangla sp.nov. (Figs 1, 5 – 8, 10 – 15)

Material examined: **Holotype** ♂ (JHAC), labelled: "China, N Sichuan [prov.], Zhangla, 14.-17.6.1996, Beneš & Štěpař lgt.". **Allotype** female (JSCC): "China, Shaanxi prov., Qing Ling Shan mts., Houzenzi vill. env., 30 km SE of Taibai Shan mt., 1500 m, 26.vi.1998, O. Šafránek & M. Trýzna lgt.". **Paratypes** (JHAC, JRUC, JSCC): 2 ♂ ♂, 2 ♂♂:"China, Gansu prov., Min Shan Mts., 2100 m, 70 km N.W. of WUDU, 1.vi.1997 A. Gorodinski leg."; 1 female, the same data but "1-10.vi.1997; prope Necrophorus sp. ? gen. ?, det. O. N. Kabakov 1998".

Description. Male: body length 17.5 – 18.4 mm (18.4 mm in the holotype), maximum body width 5.8 – 6.5 mm (6.0 mm in the holotype). Body robust, with short appendages (Fig. 1). Head black with orange clypeal membrane and anterior part of labrum; pronotum and elytra bicoloured – black with orange pattern; abdomen and legs black with yellow setation. Macropterous.

Head (Fig. 11): transverse, flat. Surface lustrous, with mesh of randomly oriented cristae and coarse punctures, separated by ca. 1.5 – 3.0 times their diameter. Punctures without perceptible setae



Figs 16 - 24: 16 - 18) *Nicrophorus smefarka* sp.nov., holotype female: 16) antennal club dorsally; 17) antenna dorsally; 18) detail of antero-lateral portion of elytron dorso-laterally. 19) *Silpha schawalleri* sp.nov., paratype male, left protarsus dorsally. 20, 21) detail of pronotal surface dorsally: 20) *S. businskyorum* sp.nov., holotype male; 21) *S. carinata* HERBST, male (Kazakhstan, Dzhungarkiy Ala-Tau, Rudnichniy vill., JRUC). 22, 23) *S. schawalleri* sp.nov., paratype male: 22) detail of pronotum dorsally; 23) detail of right elytron dorsally. 24) *S. businskyorum* sp.nov., holotype male, detail of right elytron dorsally.

inserted (at magnifications up to 70x) except for tempora, with short latero-posterior setae. Cranium with incomplete epicranial sulcus, present only in a rudimentary condition as a short, anterior, oblique deep line (Fig. 11). Eye relatively narrow, not projecting beyond lateral outline of head in dorsal view. Clypeus flat, transversely trapezoidal in shape, distinctly separated from frons by a complete fronto-clypeal suture. Clypeal membrane orange, broadly transverse, 5.6 times as wide as length. Labrum flat, slightly bilobate, broadly excavate anteriorly, with a row of long, dense, yellow setae on anterior margin and a group of more elevated, antero-laterally erected setae. Labrum black, with a transverse orange band along anterior margin. Mandible stout, parallel-sided, tapered to obtuse tip; internal margin with two large triangular teeth, situated basally on left mandible and closer to mid-length on right mandible. Lacinia with a fringe of yellow setae on inner side. Maxillary palpus elongate, trimerous (seemingly tetramerous with a distinct, sclerotized palpiger). Labium broadly bilobed, with trimerous labial palpus.

Antenna (Fig. 12): 0.48 – 0.55 times (0.52 times in the holotype) as long as maximum pronotal width, with only slightly indicated tetramerous antennal club. Proportions of antennomeres I to XI (length (maximum width in mm) in the holotype: 0.87 (0.31, 0.13 (0.18, 0.23 (0.18, 0.15 (0.20, 0.15 (0.21, 0.15 (0.24, 0.23 (0.35, 0.17 (0.54, 0.21 (0.62, 0.15 (0.62, 0.42 (0.51. Antennomeres I to VIII almost bare, brown, scape bears only a small dorsal group of setae and several distal setae. Antennomeres IX to XI opaque, black, antennomeres IX and X with large proximal setiferous granules.

Pronotum: 1.27 – 1.33 times (1.30 times in the holotype) as wide as medial length, 1.56 – 1.62 times as wide as head; cordate in shape, maximum width in anterior third, regularly convex discally, with pair of incurvate impressions postero-laterally (Fig. 1). Anterior margin very widely emarginate, not rimmed. Pronotum gradually widening antero-laterally, abruptly narrowing postero-laterally, lateral margin distinctly rimmed. Posterior margin rounded laterally, nearly straight medially, not rimmed. Bicoloured (Fig. 1): posterior portion black, laterally extending to half of pronotal length; larger, anterior portion orange, with black antero-medial spot and pair of black, oval spots discally, connected with each other medially. Surface covered with mesh of randomly oriented cristae, slightly larger and more elevate than on head (Fig. 14). Punctation of the same density as on head but with punctures very small and only superficial; no inserted setae can be observed at magnifications up to 70x.

Scutellum: black, widely triangular, with rounded posterior tip. Surface densely covered with large, oval, deeply impressed punctures anteriorly, gradually reduced to fine, superficial punctures posteriorly.

Elytra: 1.05 – 1.10 times (1.09 times in the holotype) as long as maximum width, 1.53 – 1.65 times as long as medial length of pronotum, 1.08 – 1.16 times as wide as pronotum. Elytron widened posteriorly, maximum width of elytra subapically. Elytron bicoloured (Fig. 1): black, with single, wide, orange band anteriorly, medially narrowly incomplete along elytral suture. Elytral epipleuron orange, only narrow posterior part dark brown to black. Epipleural ridge distinct, reaching to the level of middle of scutellum, without any setae posteriorly. Surface of elytron only very finely punctate, without traces of cristae as on head and pronotum, with irregular network of impressed wrinkles (Fig. 15), lacking setation except for several short, irregularly distributed, yellow setae on humerus; humeral region with mesh of randomly oriented cristae as on pronotum.

Ventral surface of body: metasternum with long, erect, yellow setae, including area posterior to coxa. Metepisternum covered with long yellow setae, metepimeral lobe constricted, bare.

Abdomen: black, with ventrite VIII apically brown. Abdomen covered with short, recumbent, yellow setae, longer laterally and also along posterior margin of ventrites. Tergum V with a pair of stridulatory files, not reaching posterior margin (distance between posterior margin and files ca. equal to width of each file). Tergum VI laterally with oval, bare spot.

Legs: metatrochanter without subapical spur on posterior margin, with simple, rounded apex. Anterior aspect of procoxa covered with long, yellow setae. Posterior margin of metacoxae without white microsetae. All tibia fossorial (Figs 10, 13), curved on external margin, flattened antero-posteriorly, with brown, robust spines; and with a prominent, triangular subapical lobe on external margin. Mesotibia with rows of spines antero-laterally and apically, another group of irregularly distributed spines situated laterally. Meso- and metatibia with two apical calcars of unequal length. Metatibia not swollen on external margin, with a row of minute, short, yellow setae postero-laterally. Metatibia 0.47 times as long as combined width of elytra, 1.04 times as long as metatarsus. Protarsus dorsally almost bare. Protarsomeres only weakly

widened, protarsus 4.0 times as long as maximum width of basiprotarsomere (Fig. 10). Basimeso- and basimetatarsomere in basal part flattened dorso-ventrally and slightly widened laterally. Tarsal empodium trisetose (with a single seta antero-laterally and two setae postero-laterally).

Aedeagus: 3.25 mm long in the holotype, stout, gradually tapered toward rounded apex, curved in lateral view (Fig. 8b). Apex only weakly sclerotized, densely covered with minute sensillae (Fig. 7). Parameres slightly incurved apically, irregularly covered with sensillae, internal margin subapically with three setae, external margin with another three setae more apically (Fig. 8a). Basal portion of aedeagus slightly asymmetrical, heavily sclerotized (Fig. 5).

Female: body length 15.9 – 20.0 mm, maximum body width 5.4 – 6.8 mm. Externally indistinguishable from male. Antenna 0.47 – 0.52 times as long as maximum pronotal width. Pronotum 1.22 – 1.32 times as wide as medial length, 1.64 – 1.71 times as wide as head. Elytra 1.07 – 1.11 times as long as maximum width, 1.53 – 1.67 times as long as medial length of pronotum, 1.10 – 1.18 times as wide as pronotum. Metatibia 0.43 – 0.51 as long as combined width of elytra, 1.09 – 1.26 times as long as metatarsus.

Female genitalia (Fig. 6): tergum IX apically prolonged to a slender process, outer margin sparsely setose. Tergum X strongly lobed, with a wide, furcate spatula. Posterior angles gradually curved. Apex latero-ventrally covered by long setae (only 2 pairs of setae in the allotype, numerous in other paratype specimens). Base of tergum X widely emarginate; medial part with distinct, dorsal, transverse ridge. Valvifer simple, not lobed, with several short setae. Coxite not produced basally, inner margin not emarginate laterally. Terminal claw absent. Apical part of coxite and stylus densely setose.

Bionomy. The holotype was collected from an ecotone between pasture and coniferous forest (with dominant *Picea* and *Abies* spp.) at altitude ca. 2500 m, together with *Ptomascopus plagiatus* (MÉNÉTRIES 1854), *Nicrophorus oberthuri* PORTEVIN, 1924 and *Carabus* sp., using pitfall traps. Allotype was collected in a burrow in yak dung on a pasture.

Name derivation. The specific name is used as a noun in apposition and refers to the village of Zhangla near which the holotype was collected.

Differential diagnosis and discussion. The new species is placed in the genus *Ptomascopus* KRAATZ, 1877, judging from the transverse head and antenna with only weakly widened club. Only two extant species of this genus are known: *P. morio* KRAATZ, 1877 and *P. plagiatus* (MÉNÉTRIÉS, 1854), both distributed in China, Korea, the Far East of Russia (Primorye region) and Japan (SHCHEGOLEVA-BAROVSKAYA 1933; SCHAWALLER 1980; LAFER 1989; RŮŽIČKA & SCHNEIDER 1996). Furthermore, two apparently related fossil taxa were described from Tertiary phosphoritic deposits in Southern France by FLACH (1890), viz. *Ptomascopus aveyronensis* and *Palaeosilpha fraasii*. Both descriptions were based on single, incomplete specimens lacking appendages. The new species differs from *P. aveyronensis* by incomplete epicranial sulcus and pronotum with pair of postero-laterally incurved impressions (Fig. 1; epicranial sulcus complete and pronotum lacking postero-lateral impressions in *P. aveyronensis* – FLACH 1890: Table I, Figs 2a, c). *P. zhangla* sp.nov. is similar to *Palaeosilpha fraasii* in shape of pronotum (Fig. 1; FLACH 1890: Table I, Fig. 1a) and in incomplete epicranial sulcus (Fig. 11; FLACH 1890: Table I, Fig. 1c) but differs from this species in epicranial sulcus not reaching fronto-clypeal suture, pronotum with pair of incurved impressions postero-laterally and elytral surface very finely punctate (Fig. 15; epicranial sulcus connected with fronto-clypeal suture, pronotum lacking postero-lateral impressions and elytral surface with distinct punctation – FLACH 1890: Table I, Figs 1b, c, f). Further study is needed to resolve the affinities of *Ptomascopus* and *Palaeosilpha* FLACH, 1890 and evaluate the proposed placement of *P. zhangla* sp.nov.

Ptomascopus zhangla sp.nov. can be differentiated from other extant species of the genus by characters given in the following key:

1a Head and pronotum with mesh of randomly oriented cristae (Fig. 14). Scape glabrous, with only a small group of setae dorsally and several setae distally; antennomeres IX and X with large proximal setiferous granules (Fig. 12). Each mandible with 2 triangular teeth on internal margin (Fig. 11). Epicranial sulcus incomplete, present only as a rudiment as a short, anterior, oblique, deep line (Fig. 11). Clypeal membrane in both sexes short, transverse, 5.6 times as wide as length. Pronotum bicoloured, with orange pattern anteriorly, bare (Fig. 1). Tarsal empodium trisetose (with single seta antero-laterally and 2 setae postero-laterally). All tibia fossorial, curved, with large subapical lobe on external margin (Fig. 10). Apex of female tergum X

with bifurcate spatula (Fig. 6). Valvifer simple, not lobed (Fig. 6). (China: Gansu, Shaanxi, Sichuan prov.) ..... *P. zhangla* **sp.nov.**

1b Head and pronotum with very fine, superficial microsculpture, oriented longitudinally in head and transversely in pronotum. Scape densely covered with setae; antennomeres IX and X with simply inserted setae. Each mandible with only single tooth on internal side. Epicranial sulcus complete or incomplete, present only in anterior half. Clypeal membrane in male narrower, 1.7 – 2.0 times as wide as medial length. Pronotum black in colour, densely pubescent anteriorly. Tarsal empodium bisetose. All tibiae straight, none with large subapical lobe on external margin. Apex of female tergum X not bifurcate. Valvifer with claw lobe present 2

2a Epicranial sulcus complete. Dorsum covered with fine, superficial punctures; only several larger punctures present in longitudinal rows on elytra. Elytra black in colour. (China, Korea, the Far East of Russia and Japan) .... *P. morio* KRAATZ, 1877

2b Epicranial sulcus incomplete, present only in anterior half. Dorsum covered with larger, deep punctures. Elytra bicoloured, anteriorly with orange strip usually reaching half of length of elytron, sometimes reduced to narrow oblique strip. (China, Korea, Far East of Russia and Japan) ..... *P. plagiatus* (MÉNÉTRIÉS, 1854)

Nicrophorus smefarka **sp.nov.** (Figs 2, 9, 16 – 18)

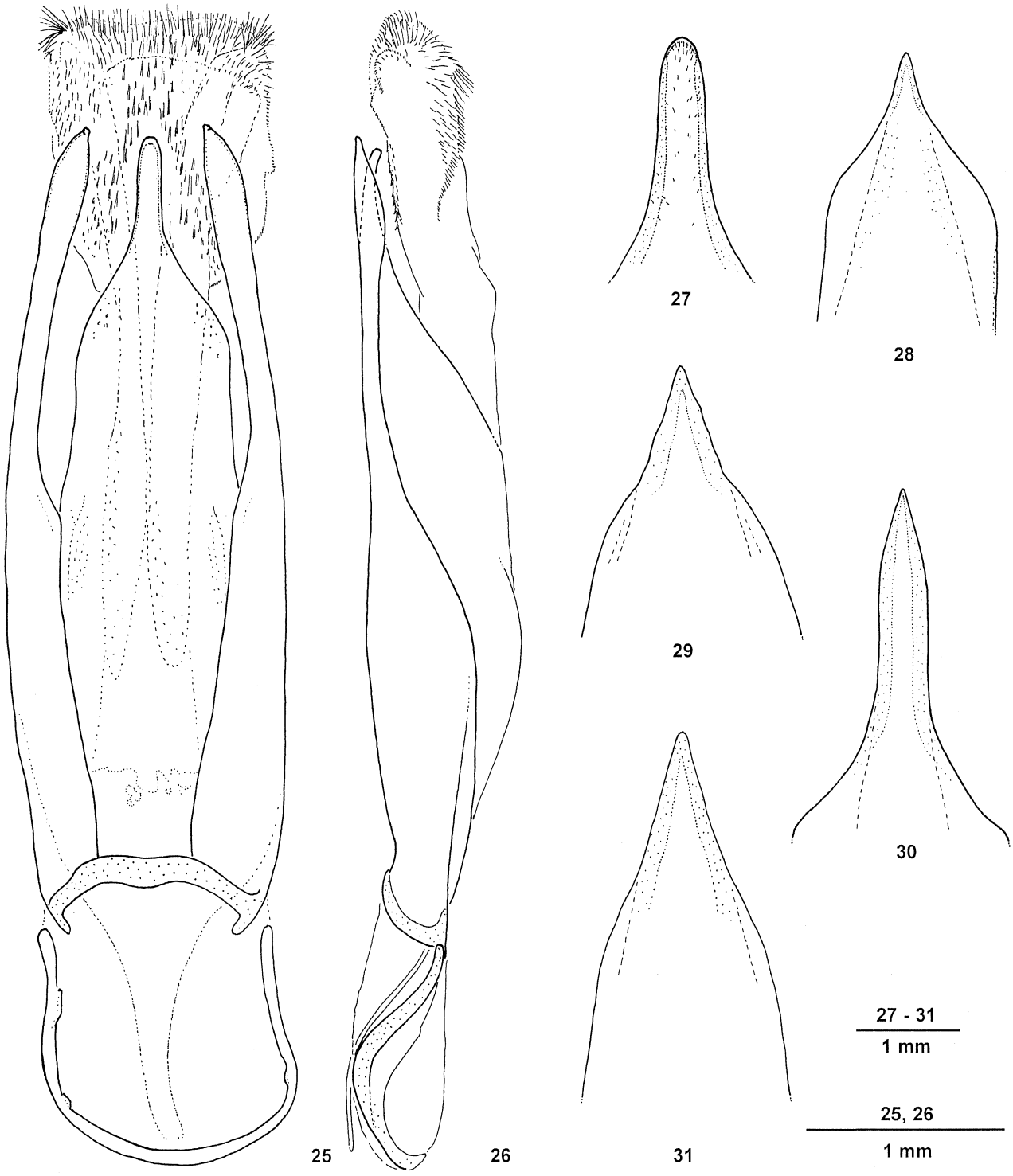
Material examined: **Holotype** female (JSCC), labelled: "CHINA: Sichuan prov., Gongga Shan, Hailuogou, above Camp 3, 3200 m, 7.vii.1996, 29 35N 102 00E, coll. by J. Farkač, P. Kabátek and A. Smetana".

Description. Female: body length 18.4 mm, maximum body width 6.5 mm. Body slender, with relatively long appendages (Fig. 2). Head black with light brown clypeal membrane and part of labrum, pronotum and ventral side of body black, elytra yellow with two transverse black bands, legs brown to black. Macropterous.

Head: 1.10 times as long as width. Surface lustrous, with sparse punctation, covered with semierect, yellow setation. Cranium with complete, profound epicranial sulci. Frons black, small orange spot absent. Eye round-triangular in lateral view, slightly constricted posterior to mid-length, with incurvate dorsal margin. Tempora with short, erect, yellow setae posterior to eye. Clypeus quadrate in shape, with elevated lateral margin and with weak medial longitudinal groove. Clypeal membrane orange to light brown, with black antero-medial part, narrowly transverse. Labrum bilobate, with row of dense, long yellow setae on anterior margin, each lobe antero-dorsally with group of elongate, yellow setae. Labrum light brown anteriorly and medially, black postero-laterally. Mandible considerably elongate, straight, in dorsal view only apically curved, very slender in lateral view except for basal portion, with two longitudinal ridges (dorsally and latero-ventrally; Fig. 17). Internal margin of mandible straight, without dentation. Cardo small, triangular. Stipes elongate, strongly sclerotized, with lateral furrow. Lacinia very slender, with fringe of yellow apical setae. Maxillary palpus with small palpiger, basipalpomere elongate, constricted basally. Comparative length of maxillary palpomeres (I to III) 1.38 : 0.79 : 1. Mentum transverse, arched laterally, medium sclerotized, antero-laterally with 3 long pairs of setae. Prementum constricted, only very weakly sclerotized. Ligula widely bilobed, prolonged to pair of crescent-shaped processes, with long yellow setae anteriorly. Labial palpus trimerous with large palpiger, palpus partially immersed to ligula, being U-shaped and deepened ventrally. Gula slender, triangular, widest anteriorly, tapered posteriorly. Gena ventrally with transverse furrows, covered with sparse, long, erect, yellow setation. Postocciput wide, with strong and dense granulation continuous across dorsum, covered with yellow setae, oriented anteriorly.

Antenna (Fig. 17): 0.81 times as long as maximum pronotal width; slender, with distinct tetramerous club, rounded in dorsal view (Fig. 16). All antennomeres black. Antennomeres I – VIII lustrous, IX – XI opaque, only laterally with sparse, short, darker setation. Antennomere VIII weakly transverse, nearly round to oval in cross section.

Pronotum: 1.07 times as wide as long medially, 1.52 times as wide as head; unusually slender, almost subquadrate in shape, widest at anterior third, disc considerably convex (Fig. 2). Anterior margin straight, anterior angle widely rounded. Lateral sides almost parallel, only weakly tapered posteriorly. Posterior angle regularly rounded, posterior margin slightly sinuous. Pronotal surface bearing three pairs of bumps: two smaller anterior and antero-laterally and one large postero-medial, separated by distinct grooves, with distinct medial line. Pronotum explanate laterally (behind mid-length) and posteriorly. Surface with fine isodiametric micro-sculpture, covered with large punctures, separated



Figs 25 – 31. 24, 25: *Silpha businskyorum* sp.nov., holotype male: 25) aedeagus ventrally; 26) aedeagus laterally. 27 – 31: *Silpha* spp., tips of aedeagi ventrally: 27) *S. businskyorum* sp.nov., holotype; 28) *S. perforata* GEBLER (Russia, Primorskiy region, Terney vill., JRUC); 29) *S. longicornis* PORTEVIN (Japan, Saitama Pref., Ontaki vill., K. Harusawa det., JRUC); 30) *S. imitator* SHIBATA (Japan, Nara Pref., Ohmine mts, K. Harusawa det., JHAC); 31) *S. carinata* HERBST (Slovakia, Slovenský kras, Turňa-Háj vill., JRUC).

by a distance slightly larger than their diameter. Each puncture with an inserted large, semierect yellow seta, oriented mostly posteriad except for explanate lateral portions of pronotum with laterad setation.

Scutellum: triangular, rounded posteriorly. Surface densely punctate antero-medially, laterally and in posterior half punctation becoming more sparse.

Elytra: 1.09 times as long as wide, 1.48 times as wide and 1.73 times as long as pronotum; yellow,

with two transverse black bands, each band with brown margin. Anterior black band reduced, laterally not reaching elytral epipleuron, widely interrupted medially. Posterior black band wide, complete medially, margin undulate (Fig. 2). Elytral suture brown, becoming orange posteriorly. Elytral epipleuron yellow with posterior black band crossing onto it, not fully reaching lateral elytral margin. Surface covered with punctures slightly larger than those on pronotum, separated by ca. 1.0 – 1.5 their diameter; surface with isodiametric microsculpture, covered with very long, dense, semierect to erect yellow setation, oriented posteriad. Intermixed with shorter, black setae, distributed mainly in latero-dorsal portion of each elytron (Fig. 18) but also sparsely present on disc and on posterior margin of elytra. Elytral epipleuron covered with sparse, erect black setae and intermixed with short, yellow microsetae. Epipleural ridge only weakly developed as indicated line, reaching to level of middle of scutellum, posteriorly without distinct row of setae, with sparse preapical setae of medium length also expressed on elytron along anterior part of epipleural ridge.

Ventral side of body: metasternum with short, yellow setae between mesocoxae, becoming long and erect posteriorly, also behind metacoxae. Pair of lateral transverse bare strips, not connected medially, present sub-posteriorly; distinct also in interrupted setation pattern of posterior part of mesosternum. Metepisternum and metepimeral lobe covered with long yellow setae.

Abdomen: black with ultimate segment brown. Terga medially covered with short, recumbent, black setae. All visible terga laterally, penultimate and ultimate tergum entirely, covered with long, golden, dense, semierect setation (Fig. 2). Tergum VI laterally with oval, bare spot. Ventrites I - IV black, ventrite V with posterior half brownish, ventrite VI entirely brown. Ventrites I - IV covered with short, recumbent, black setae, in addition to longer, yellow setae on postero-lateral margin. Posterior half of ventrites V and VI with long, semierect yellow setae.

Legs: metatrochanter with short, narrowed and sharp subapical tooth on posterior margin. Anterior aspect of procoxa with long, black setae on basal half. Metafemur stocky in apical half. Protibia with latero-apical angle produced into large, slender lobe, mesotibia with apical angle not produced, metatibia with small lobe. Mesotibia almost straight on external margin. Metatibia straight, not swollen on external margin; 0.62 times as long as combined width of elytra; 1.10 times as long as metatarsus. Tarsal empodium bisetose.

Female genitalia (Fig. 9): tergum IX apically prolonged to slender process, outer margin densely setose; short setae present also dorsally. Tergum X with lobe medium in length, not bifurcate, without apical spatula, almost flat in dorsal view. Posterior angles gradually curved. Apex laterally covered by dense, long setae; shorter setae also sparsely distributed dorsally. Base of tergum X widely emarginate; medial part without dorsal, transverse ridge. Valvifer simple, not lobed and without setae. Coxite not produced basally, inner margin not emarginate laterally. Terminal claw absent. Apical part of coxite and stylus densely setose.

Male: unknown.

Bionomy. The specimen was collected from dead unidentified specimen of the order Insectivora, in a montane, mixed broadleaved and coniferous forest.

Name derivation. The specific name is composed from several initial letters of the names of collectors.

Differential diagnosis. Several species groups are recognized within the genus *Nicrophorus* FABRICIUS, 1775, as in the papers of HATCH (1927) and PECK & ANDERSON (1985). However, some eastern Palaearctic species are not yet classified in any of the existing groups; the genus is presently under revision by D. SIKES (in prep.). *N. smefarka* sp.nov. does not seem to be closely related to any known species of the genus. From all described species of *Nicrophorus*, the new species differs in the shape of the pronotum, which is very narrowed anteriorly (Fig. 2). In setation of the dorsal surface and in the pattern of maculation, *N. smefarka* sp.nov. is most similar to *N. dauricus* MOTSCHULSKY, 1860. However, the process on tergum IX of the genitalia is shared only with *N. przewalskii* SEMENOW, 1894 of the genus *Nicrophorus* and *P. morio*, *P. plagiatus* and *P. zhangla* sp.nov. of the genus *Ptomascopus*. The presence of this process in the genus *Ptomascopus* indicates it is probably a plesiomorphy. Thus, the loss of the process would be a synapomorphy uniting the remaining *Nicrophorus* species. If there has been no homoplasy in this character, then *N. smefarka* sp.nov. would represent one of the two most basal lineages of the genus (D. SIKES, in litt.).

The following key is presented for *Nicrophorus* species with an entirely black antennal club (partially following ANDERSON & PECK 1985):

1a Elytra entirely black, sometimes only with 2 or

4 red spots on disc 2

1b Elytra black with 2 wide, red fasciae, sometimes fused together 3

2a Antennal club compact, rounded. Pronotum lustrous, regularly convex with weakly separated anterior bumps and with only narrowly flattened margins. Elytra black, sometimes only with 2 or 4 red spots discally. Metatibia at middle of external margin considerably swollen. Robust species (24 – 34 mm). (Palaearctic Region) .... *N. germanicus* (LINNÉ, 1758)

2b Antennal club oval, more elongated. Pronoum opaque, with fine microscupture, weakly convex with distinctly separated anterior bumps and with widely flattened margins. Elytra always black. Metatibia at middle of external margin not swollen. Smaller species (19 – 24 mm) (Eastern Siberia, Japan) .... *N. tenuipes* LEWIS, 1887

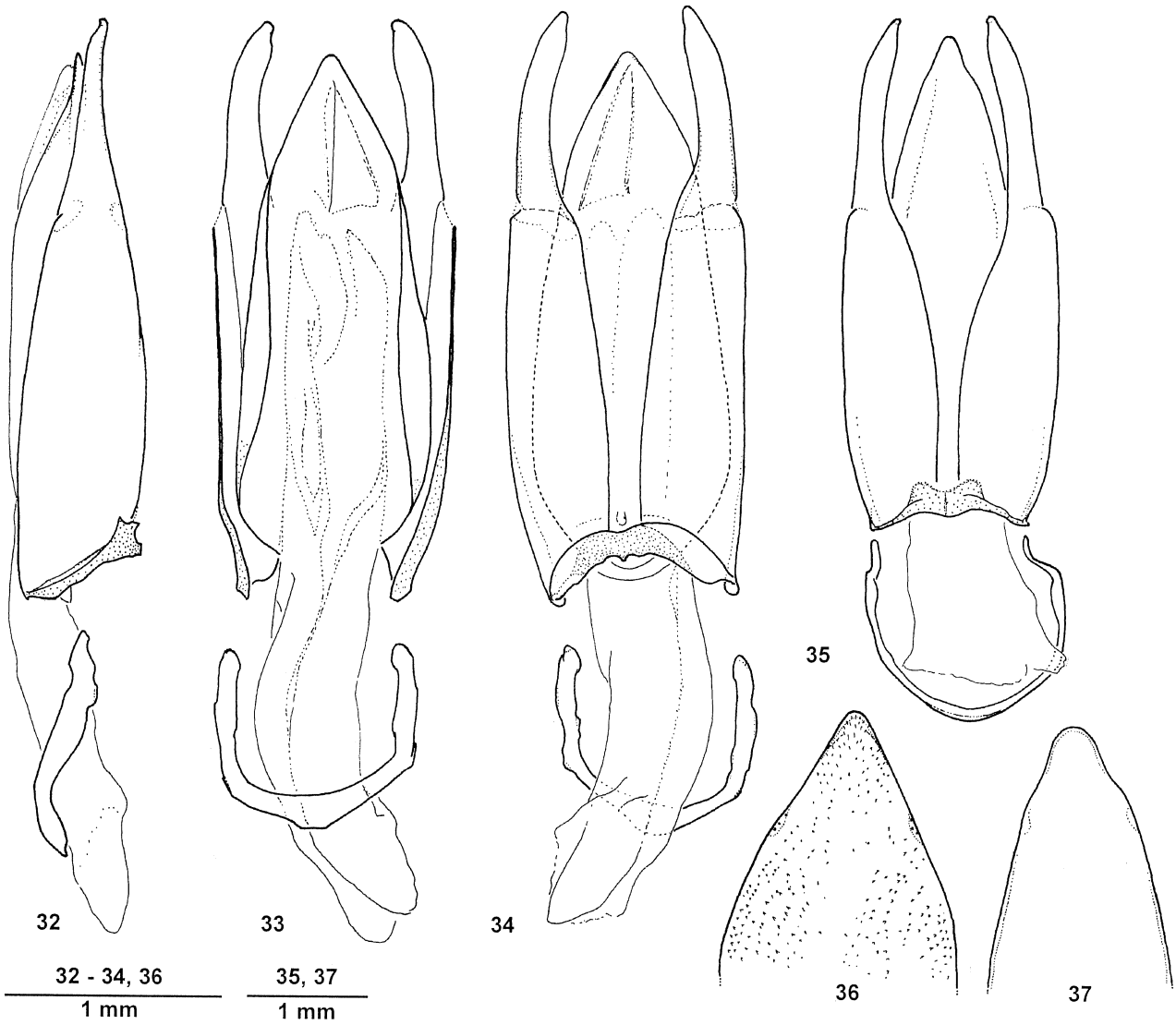
3a Pronotum entirely or at least anteriorly covered with long, distinct setation 4

3b Pronotum bare anteriorly and on disc, at most minute setae present laterally 7

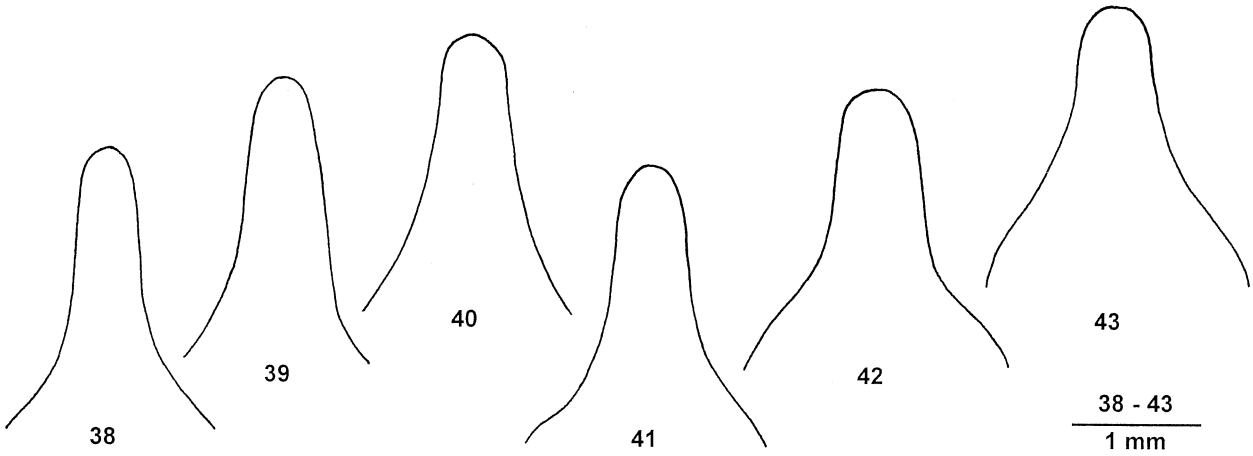
4a Pronotum marginally and discally with setation; quadrate or subquadrate in shape. Metafemora covered with short, dark setae ventrally 5

4b Pronotum discally bare with setation present only marginally; subquadrate in shape. Metafemora covered with longer, yellow setae ventrally 6

5a Pronotum covered with dense, long setation except for pair of small, bare areas medio-laterally. Pronotum subquadrate, widened anteriad. Elytra with long yellow setae present laterally and posteriorly; with yellow, minute setae



Figs 32 – 37: 32 - 35 *Silpha schawalleri* sp.nov., holotype male: 32) aedeagus laterally; 33) aedeagus dorsally; 34) aedeagus ventrally; 35) tip of aedeagus ventrally; 36, 37 *S. qinlinga* SCHAWALLER (China, Shaanxi prov., Qin Ling mts, central ridge, JRUC): 36) aedeagus ventrally; 37) tip of aedeagus ventrally.



Figs 38 – 43 *S. businskyorum* sp.nov., variability of the tip of aedeagus, ventral aspect: 38 - 40) male paratypes (China, Shaanxi prov., Houzhenzi env., JRUC); 41- 43) male paratypes (China, Shaanxi prov., Hua Shan mt, JRUC).

distally. Posterior fascia separated from apex of elytron by black posterior strip. Abdomen with black setation, only the last visible segment with yellow setation. (Nearctic Region) .... *N. tomentosus* WEBER, 1801

5b Entire pronotum covered with dense, finer, erect setation. Pronotum quadrate, narrowed anteriad (Fig. 2). Elytra both laterally and discally covered with long, yellow, erect setae; laterally interposed shorter, black setae (Fig. 18). Posterior fascia reaching apex of elytron. Abdomen with three last visible segments covered with yellow setation (Fig. 2). (China: Sichuan prov.) ..... *N. smefarka* **sp.nov.**

6a Pronotum with dense, long, erect setation only on anterior margin, lateral margins bare. Elytra with long, yellow setation only antero-laterally and posteriorly, disc bare. (France to Caucasus) ..... *N. nigricornis* FALDERMANN, 1835

6b Pronotum with long marginal setation also present laterally and posteriorly. Elytra with long, yellow setation laterally, also sparsely on disc. (Mongolia, Siberia, China) .... *N. dauricus* MOTSCHULSKY, 1860

7a Pronotum almost bare, with only very minute marginal setation laterally. Elytra opaque. Robust species (body length 25 – 32 mm). (China) ..... *N. przewalskii* SEMENOV, 1894

7b Pronotum bare. Elytra lustrous. Usually smaller species (body length 12 – 18 mm, except for *N. validus*) 8

8a Pronotum trapezoidal in shape 9

8b Pronotum quadrate in shape, with widely flattened margins 10

9a Elytra black with two red, confluent, large, laterally fused fasciae. (Chile, Argentina) ..... *N. chilensis* PHILIPPI, 1871

9b Elytra black with two distinct red fasciae. Anterior fascia confluent, posterior one broken medially. (Northern India, China) .... *N. validus* PORTEVIN, 1920

10a Base of elytral epipleuron orange, with prebasal black spot. Antennomeres IX and X dorsally and ventrally with patch of dense white setae arranged in "figure eight" pattern. (Holarctic Region) ..... *N. vespilloides* HERBST, 1783

10b Base of elytral epipleuron entirely black. Antennomeres IX and X dorsally and ventrally without dense white setae, though vestige of "figure eight" pattern may be present. (Nearctic Region) ..... *N. defodiens* MANNERHEIM, 1846

Silpha businskyorum sp.nov.

(Figs 3, 19, 24 – 27, 38 – 43)

Material examined: **Holotype** male (JSCC), labelled: "CHINA: S-Shaanxi [prov.], Qinling Mts. - S slope, Xunyangba - S+W env., 33 o28-37((N(/108 o23-33((E(, 1400-2100 m, 5.-9.6.1995, L.+ R. Businský lgt.". **Allotype** female (JSCC): the same data. **Paratypes** (JHAC, JSCC, JRUC, JZIP, NKME, SMNS, VBEC, ZMHB): 28 males, 148 females, labelled: "CHINA, Shaanxi prov., Zhouzhi Co., [Qin Ling Shan mts] Houzhenzi env., 1200 m, 18-25.vii.1998, V. Beneš leg."; 28 males, 37 females, labelled: " CHINA (Shaanxi [prov.]) Qin Ling Shan [mts], 110.04E 34.30 N, Hua Shan [mt] 100 km E Xian, 1500 m, 7.-14.VII.1996".

Description. Male: body length 15.2 – 18.1 mm (17.9 mm in the holotype), maximum body width 7.7 – 8.9 mm (8.8 mm in the holotype). Body vaulted, elongate, with relatively long antennae and legs (Fig. 3). Pronotum and elytra dark brown; head, antennae, legs and ventral part of body black. Apterous.

Head: surface lustrous, with irregular punctation; covered with short, recumbent yellow setation. Cranium with dorso-medial pit. Eye kidney-shaped in lateral view. Clypeus anteriorly notched, covered with yellow setation, punctation more sparse than in cranium. Anterior margin of clypeus with row of dense, long, yellow setae. Mandible with teeth absent from internal side, base with sparse yellow setation. Lacinia with dense yellow setation on internal side. Maxillary palpus trimerous. Two basal palpomeres conically expanded apically, with sparse yellow setation; ultimate palpomere oval, bare. Labium with dense yellow setation, labial palpus short, trimerous. Head ventrally with distinct trapezoidal gula, separated latero-ventrally from epicranium by distinctly indicated gular suture.

Antenna: 0.86 – 0.94 times (0.92 in the holotype) as long as maximum pronotal width. Proportions of antennomeres I to XI in the holotype (length (maximum width in mm): 1.45 (0.41, 0.84 (0.31, 0.56 (0.29, 0.48 (0.30, 0.44 (0.31, 0.46 (0.32, 0.44 (0.41, 0.55 (0.45, 0.46 (0.54, 0.42 (0.54, 0.72 (0.59. Antennomeres I to VIII conically expanded apically, lustrous, with sparse, long, yellow setation. Antennomeres IX and X spherical, XI oval. All three ultimate antennomeres opaque, with dense tomentum intermixed with sparse longer setae.

Pronotum: 1.52 – 1.64 times (1.58 in the holotype) as wide as medial length, 2.66 – 2.85 times (2.84 in the holotype) as wide as head; trapezoidal, strongly convex discally and postero-laterally. Margin rimmed only in anterior half; anteriorly with wide, shallow excision, anterior angles weakly elevated. Lateral margin regularly arched, pronotum widest before posterior angles. Posterior margin slightly sinuous. Pronotal surface lustrous, disc with very fine and sparse punctation, punctures clearly separated (Fig. 20). Laterally, punctures becoming more dense, deeply impressed. Pronotum bare, only with small row of minute setae in anterior angles.

Scutellum: irregularly triangular, densely punctate.

Elytra: 1.14 – 1.23 times (1.26 in the holotype) as long as maximum width, 1.98 – 2.16 times (2.05 in the holotype) as long as medial length of pronotum, 1.06 – 1.15 times (1.13 in the holotype) as wide as pronotum; disc distinctly convex. Each elytron with three ridges, none reaching apex of elytron; external ridge shortest, reaching only two thirds of elytral length basally. Lateral margin of elytra strongly elevate, grooves becoming deep and wide behind humeri. Apical part of each elytron nearly rectangular. Surface lustrous, bare, with irregular punctation, punctures separated by 1.0 – 1.5 their diameter (Fig. 24). Each puncture with small setiferous granule on anterior margin, bearing minute yellow seta (shorter in length than diameter of puncture). Elytral epipleuron lustrous, with isodiametric microsculpture, sparsely punctuate, covered with recumbent yellow setation.

Ventral surface of body: finely punctate, covered with short, recumbent, yellow setation. Prosternum with prominent projection anterior to forelegs. All trochanters with group of only minute yellow setae, oriented posteriad.

Legs: elongate. Pro-, meso- and metatibia with two robust apical spurs of different length. Metatibia 0.64 – 0.69 times (0.69 in the holotype) as long as combined width of elytra, metatibia 1.09 – 1.28 times (1.10 in the holotype) as long as metatarsus. Protarsus medially widened.

Aedeagus: large, stout (Figs 25, 26), length 5.4 mm. Basal portion U-shaped, slightly asymmetrical. Apex prolonged to slender tip, almost parallel-sided, regularly rounded apically (Fig. 27), slightly curved in lateral view (Fig. 26). Paramere robust in basal half, narrowed in distal part, stout subapically (Figs 25, 26). Internal sac of aedeagus partially everted in holotype, covered with irregularly dispersed teeth of various lengths – larger medio-ventrally, small laterally and apically (Figs 25, 26).

Female: similar to male, protarsus not widened. Body length 15.7 – 19.2 mm (17.3 mm in the allotype). Pronotum 1.53 – 1.65 times (1.56 in the allotype) as wide as medial length, 2.64 – 2.83 times (2.64 in the allotype) as wide as head. Elytra 1.16 – 1.28 times (1.19 in the allotype) as long as maximum width, 2.02 – 2.35 times (2.15 in the allotype) as long as medial length of pronotum, 1.07–1.19 times (1.16 in the allotype) as wide as pronotum. Protibia simple, not widened. Metatibia 0.61–0.69 times (0.64 in the allotype) as long as combined width of elytra, metatibia 1.04–1.26 times (1.04 in the allotype) as long as metatarsus.

Variability. Specimens from lower altitude (Houzhenzi env., ca. 1200 m) are generally larger and wider than those from higher altitude (Hua Shan mt, ca. 1500 m). However, no obvious differences were found in proportions of pronotum (Table 1), punctation and/or microsculpture of the body dorsum. Males also considerably vary in the shape of aedeagus: apex is distinctly narrow in the holotype, slightly wider in specimens from Houzhenzi env., and wide in specimens from Hua Shan mt, but with continuous variation (Figs 27, 38 – 43). All specimens examined are thus considered to be conspecific.

Table 1. Variation in the body proportions in paratypes of *Silpha businskyorum* sp.nov. [treated as follows: mean value (minimum – maximum)]. Ten male and ten female specimens measured from each locality.

sex	locality	altitude	body length	max. body width	pronotum width / medial length ratio
males	Houzhenzi env.	1200 m	17.3 mm (16.6–18.1 mm)	8.6 mm (8.3–8.9 mm)	1.56 (1.53–1.60)
	Hua Shan mt	1500 m	16.2 mm (15.2–16.9 mm)	8.0 mm (7.7–8.1 mm)	1.58 (1.52–1.63)
females	Houzhenzi env.	1200 m	18.1 mm (17.1–19.2 mm)	9.2 mm (8.6–9.6 mm)	1.57 (1.54–1.63)
	Hua Shan mt	1500 m	17.0 mm (15.7–18.1 mm)	8.3 mm (7.8–8.7 mm)	1.58 (1.53–1.65)

Bionomy. The holotype and allotype were collected in deciduous forest, in a deep valley near a stream. The paratypes from Houzhenzi were collected from an ecotone between meadow and coniferous forest (with intermixed *Quercus* spp.) in the wide valley of a river, using baited pitfall traps. Paratypes from Hua Shan mt were collected in a narrow cleft with spring, covered with deciduous forest and partly with bushes and young trees, using pitfall traps.

Name derivation. The species is named after Ludmila and Roman Businský from Praha, the first collectors of the new species.

Differential diagnosis. *Silpha businskyorum* sp.nov. belongs to the group of species containing *S. carinata* HERBST, 1783, *S. imitator* SHIBATA, 1969, *S. longicornis* PORTEVIN, 1926, *S. perforata* GEBLER, 1832 and *S. yamatona* KÔNO, 1929). It is characterized by the following combination of characters: (1) antennomere VIII 1.25 – 1.60 times as long as antennomere IX (with exception of *S. perforata*); (2) pronotum bare; (3) lateral margin of elytra widened anteriad; (4) aedeagus robust, large; with apex suddenly narrowing to slender tip of variable length (Figs 27 – 31).

Silpha businskyorum sp.nov. can be differentiated from other species of this group by the characters given in the following key:

1a Pronotum disc with only very superficial punctation, hardly visible under 50(magnification (Fig. 20). Elytra distinctly convex in lateral view. Tip of aedeagus regularly rounded (Figs 27, 38 – 43). (China: Shaanxi prov.) .... *S. businskyorum* **sp.nov.**

1b Pronotum disc as coarsely punctate as laterally, or punctures are finer but distinctly visible also under 50(magnification (Fig. 21). Elytra flat to medium convex in lateral view. Tip of aedeagus sharply pointed (Figs 28 – 31) 2

2a Antennomere VIII 1.0 – 1.1 times as long as antennomere IX. Elytra usually with metallic lustre. Tip of aedeagus (Fig. 27). (Siberia to Japan, incl. North-Eastern China) .... *S. perforata* GEBLER, 1832

2b Antennomere VIII 1.25 – 1.60 times as long as antennomere IX. Elytra always without metallic lustre 3

3a Pronotum flat or entire dorsal surface of pronotum regularly convex, lateral depressed line only weakly indicated. Apical part of aedeagus parallel-sided, only tip tapered (Fig. 31). (Europe to Eastern Siberia) .... *S. carinata* HERBST, 1783

3b Pronotum disc only regularly convex, lateral region flat, lateral depressed line distinctly deep. Apical part of aedeagus widely tapered to tip (Figs 29, 30) (Japan) 4

4a Apical part of aedeagus short (Fig. 29) .... *S. longicornis* PORTEVIN, 1926

4b Apical part of aedeagus more elongate (Fig. 30) ..... *S. imitator* SHIBATA, 1969

Note. *S. yamatona* is not included in the above key, because the description is based on a single female specimen (KÔNO 1929). The type locality of *S. yamatona* is the same as in *S. imitator* (S. NOMURA, in litt.). The bicostate elytra of the holotype of *S. yamatona* could be caused by individual variability, similar to that known in aberrant specimens of *S. carinata* (bicostate specimens; specimens with elytra asymmetrical with 2/3 costae combined – see ŠUSTEK 1983: 5, figs 25 – 27). Also, the geographical variability of *S. imitator* and *S. longicornis* is inadequately known and further study, clarifying status of all three species, is needed (S. NOMURA in litt.).

Silpha schawalleri sp.nov.

(Figs 4, 19, 22, 23, 32 – 35)

Material examined: **Holotype** male (SMNS), labelled: "CHINA, Sichuan prov., Paß [Pass] zw. [between] Zhangla und Huanglong, 3200-3400 m, 27-28.VI.1996, Walter Heinz lgt.". **Allotype** female (SMNS): the same data. **Paratypes** (SMNS, JHAC, JSCC and JRUC): 32 males, 10 females, the same data.

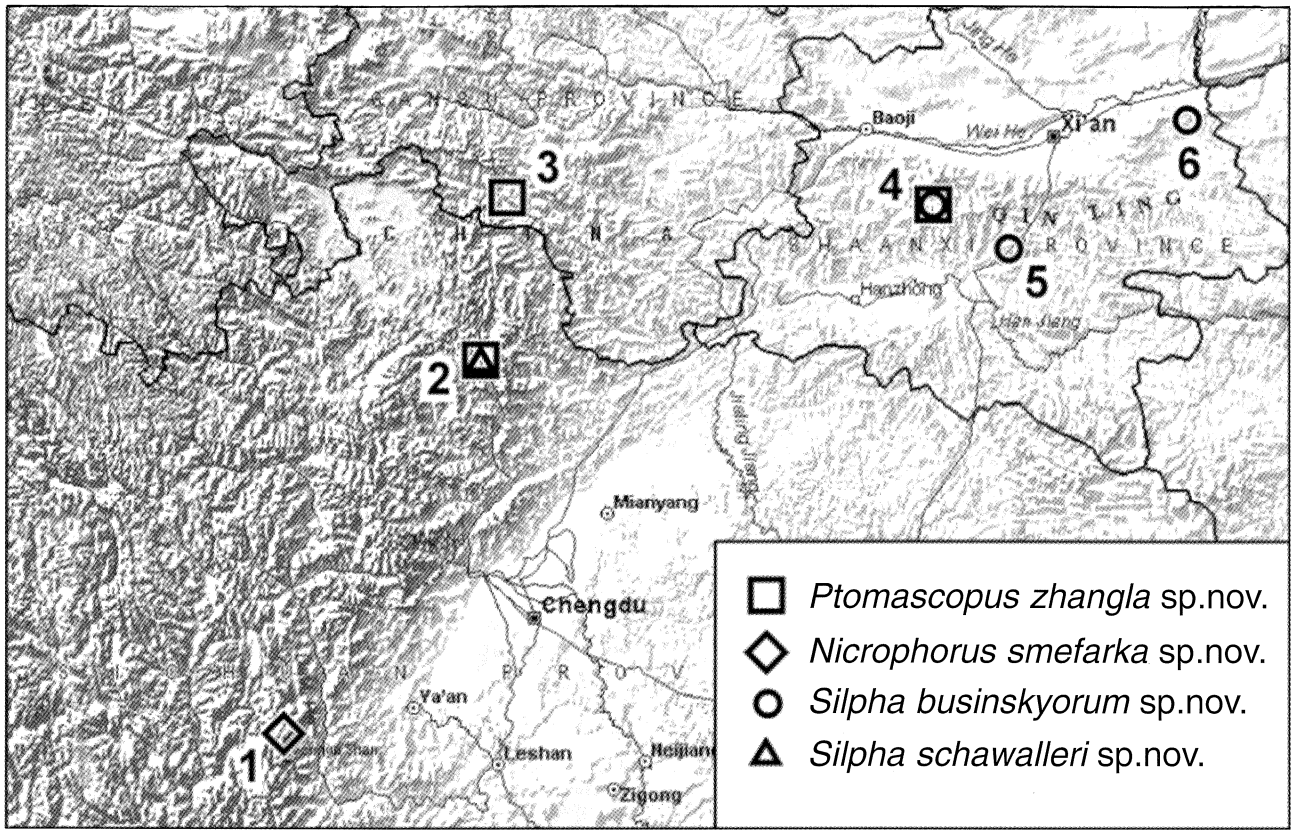


Fig. 44: Map of distribution of the new species throughout China: 1) Gongga Shan mt, Hailuogou; 2) Zhangla vill.;3) Min Shan mts; 4) Houzhenzi vill.; 5) Xunyangba vill.; 6) Hua Shan mt.

Description. Male: body length 12.2 – 13.5 mm (mean 12.8 mm, means always given for 10 male specimens), maximum body width 5.36 – 5.93 mm (mean 5.73 mm). Body flat, elongate, with relatively long antennae and legs (Fig. 4). Pronotum and elytra brown; head, antennae, legs and ventral part of body dark brown to black. Apterous.

Head: elongate, clypeus and anterior part of head anterior of antennal insertion lustrous, with irregularly distributed, large punctures. Posterior part of head opaque, with gibbous punctures, touching each other. Setation short and recumbent, yellowish. Cranium medially with distinct mound, posteriorly with transverse, oval protuberance. Eye kidney-shaped in lateral view. Clypeus medio-anteriorly notched, covered with long, yellow, anteriorly oriented setae. Anterior margin of clypeus with row of dense, long, yellow setae. Left mandible with three teeth, right with two triangular teeth on internal side. Mandible with row of 7 – 10 setae on external margin. Lacinia with distinctly sclerotized, slightly incurvate apical processes, lacinia with dense yellow setation on internal side. Maxillary palpus elongate, trimerous. Two basal palpomeres conically expanded apically, with yellow setation, ultimate palpomere tapering to bare apex. Comparative length of maxillary palpomeres (I to III) 1.36: 1.18: 1. Labium with dense yellow setation, labial palpus short, trimerous, comparative length of labial palpomeres (I to III) 1:0.82:1. Head ventrally with distinct trapezoidal gula, separated latero-ventrally from epicranium by clearly indicated gular suture.

Antenna: 1.0 – 1.1 times as long as maximum pronotal width. Proportions of antennomeres I to XI (length (maximum width in mm): 1.10 (0.27, 0.61 (0.23, 0.48 (0.21, 0.46 (0.23, 0.45 (0.23, 0.39 (0.23, 0.44 (0.24, 0.45 (0.28, 0.44 (0.35, 0.42 (0.35, 0.66 (0.34. Antennomeres I to VIII conically expanded apically, lustrous with isodiametrical microsculpture, covered with with sparse, long, yellow setation. Antennomeres IX and X spherical, XI elongate, all three antennomeres opaque with dense tomentum.

Pronotum: 1.52 – 1.70 times (mean 1.58) as wide as medial length, 2.62 – 2.83 times (mean 2.73) as wide as head; trapezoidal, depressed, only weakly and irregularly convex, laterally only feebly elevate. Anterior margin of pronotum with deep trapezoidal excision. Lateral margin regularly arched, pronotum

widest before posterior angles. Posterior margin subsinuous, laterally only weakly, regularly notched. Pronotal margin simple, not rimmed, except for lateral margin of anterior excision. Pronotal surface oblique, disc with dense fine punctation, small punctures nearly touching each other. Laterally, punctures more impressed (with diameter ca. 3 times larger than discally) and sparse (separated by ca. 1.5 times their diameter). Pronotum covered with very short, recumbent, regularly spaced, sparse, yellow setation (Fig. 22).

Scutellum: irregularly triangular.

Elytra: 1.30 – 1.42 times (mean 1.35 times) as long as maximum width, 2.16 – 2.37 times (mean 2.27) as long as medial length of pronotum, 1.00 – 1.10 times (mean 1.07) as wide as pronotum. Elytra flat, distinctly convex only medio-posteriorly. Each elytron with three similar, only weakly indicated ridges; external ridge reaching only basal two thirds of elytral length. Lateral margin only weakly, narrowly and regularly elevated. Apical part of each elytron separately rounded, usually slightly asymmetrically. Surface oblique, with irregular rows of large oval punctures, separated by 2–5 times their diameter (Fig. 23). Anteriorly, fossa of each puncture with inserted short, recumbent yellow seta, oriented posteriorly, slightly transcending in length the diameter of the puncture. Elytral epipleuron narrow, oblique; with sparse, irregular punctation.

Ventral surface of body: finely punctate, covered with short, recumbent setation; setae longer than on elytra. Prosternum with prominent projection anterior to forelegs. All trochanters and posterior margin of metasternum with group of larger, yellow setae, oriented posteriorly.

Legs: elongated. Pro-, meso- and metatibia with two robust apical spurs of different length. Metatibia 0.68 – 0.71 times as long as combined width of elytra, 1.05 – 1.14 times (mean 1.09) as long as metatarsus. Protarsus only weakly widened (Fig. 19).

Aedeagus (Figs 32 – 34): stout, with wide tip, regularly tapered toward rounded apex, in dorsal view (Fig. 35). Internal sac heavily sclerotized; basal portion composed of great number of very small, irregularly, transversely arranged denticles. Paramere slightly incurvate, weakly widened subapically. Basal portion of aedeagus U-shaped, slightly asymmetrical.

Female: similar to male, protarsus not widened. Body length 13.1 – 14.2 mm (mean 13.6 mm, means always given for 10 female specimens). Pronotum 1.52 – 1.64 times (mean 1.56) as wide as medial length, 2.63 – 2.83 times (mean 2.69) as wide as head. Elytra 1.34 – 1.42 times (mean 1.38) as long as maximum width, 2.31 – 2.46 times (mean 2.38) as long as medial length of pronotum, 1.05 – 1.14 times (mean 1.10) as wide as pronotum. Metatibia 1.09 – 1.22 times (mean 1.15) as long as metatarsus.

Bionomy. The specimens were taken using baited pitfall traps, located in a pasture with scattered shrubs near a spring.

Name derivation. The species is named after Wolfgang Schawaller from SMNS, in recognition of his research on Palaearctic Silphidae.

Differential diagnosis. *Silpha schawalleri* sp.nov. is closely related to *S. qinlinga* SCHAWALLER, 1996 (described recently from China, Shaanxi prov., Qin Ling Shan mts). Both species have relatively isolated position within the genus *Silpha* LINNEAUS, 1758 and can be characterized by the following combination of characters: (1) body flat and slender, with relatively elongated appendages; (2) male protarsus only weakly widened; (3) pronotum with deep trapezoidal excision medio-anteriorly and (4) pronotal and elytral surface with short but distinct setation.

Silpha schawalleri sp.nov. can be differentiated from *S. qinlinga* by characters given in the following key:

1(2) Head with medial raised protuberance. Lateral margin of pronotum flattened (Fig. 4). Lateral margin of elytra narrow and only weakly elevated, all elytral ridges only weakly indicated (Figs 4, 23). Aedeagus with wide, regularly tapered tip (Fig. 35), basal portion of aedeagus robust (Figs 32 – 34). (China: Sichuan prov.) ..... *Silpha schawalleri* **sp.nov.**

2(1) Head with medial pit. Lateral margin of pronotum more elevated (SCHAWALLER, 1996: Fig. 1). Lateral margin of elytra wider and distinctly elevated, external pair of elytral ridges distinctly elevate along whole length, intermediate pair of ridges elevate subapically on elytra (SCHAWALLER, 1996: Figs 1, 2). Aedeagus with more elongate, subapically slightly sinuate tip (Fig. 37, SCHAWALLER, 1996: Fig. 8), basal portion of aedeagus weak (Fig. 36). (China: Shaanxi prov.) .... *Silpha qinlinga* SCHAWALLER, 1996

Acknowledgements

We are grateful to Wolfgang Schawaller (SMNS), Andrey Gorodinski (Moscow), Vladimír Beneš, Ludmila and Roman Businský, Jan Farkač and Petr Kabátek (all Praha), Aleš Smetana (Ottawa)

and David W. Wrase (Berlin) for the possibility to study the interesting material of Silphidae from China. We are indebted to Shûhei Nomura (National Science Museum, Tokyo) for valuable information about Japanese species of *Silpha*. Many thanks are due to Jiří Zídek (Praha) for making the habitus photographs, Miloš Knížek, Petr Kapitola and Miroslav Barták (all Praha) for help with the microphotographs, Jakub Rolčík (Bi-MAC Graphics Inc., Praha) for typography of the illustrations and David Král (Praha), Stewart B. Peck (Ottawa), Derek S. Sikes (Storrs) and Jiří Zídek (Praha) for valuable comments on the manuscript.

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Manuscript received: 12. 7. 1999