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Notes on new and poorly known Chinese Bembidiina (Coleoptera: Carabidae)

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Abstract

The examination of male paratypes of *Bembidion parepum* JEDLIČKA, 1933 (Coleoptera: Carabidae) from China confirms that this species belongs to the subgenus *Ocydromus* CLAIRVILLE, 1806 sensu TOLEDANO (2008a) and more precisely to the *B. deletum* SERVILLE, 1821 species-group (subgenus *Peryphanes* JEANNEL, 1941 auct.). *Bembidion parepum* is redescribed here and its male genitalia are described for the first time. Two Chinese *Bembidion* species, *B.* (*Ocydromus*) *magrinii* (China, Qinghai) and *B.* (*Ocydromus*) *heineri* (China, Xinjiang) (both belonging to the *O. straussi* species-group) are described as new.

The male genitalia of *Amerizus* (*Tiruka*) *baxiensis* DEUVE, 1998 are described for the first time and a new monospecific species-group is proposed for *Amerizus* (*Tiruka*) *wrzecionkoi* DEUVE, 1998.

Key words: Coleoptera, Carabidae, Bembidiina, *Bembidion*, *Ocydromus*, *Peryphanes*, *Peryphus*, *Amerizus*, *Tiruka*, *Caecidium*, China, Palaearctic Region, taxonomy.

Introduction

In a difficult group like the Bembidiina, it can be important to pay attention to poorly known species in order to make clear their systematic position. Each small discovery works like a puzzle piece and helps to arrange the subtribe in a less chaotic way. This is the case with a rare Chinese species, *Bembidion parepum* JEDLIČKA, 1933, which formerly was known to me only from the female holotype. Recently I was able to study two male paratypes, which allowed me to discuss here for the first time the systematic position of the species on the basis of the male genitalia, till now unknown. This species in fact belongs to a species-group formerly not reported for China. The same applies for two new species described below. Both species-groups contribute to increase again the biodiversity of the Bembidiina of this region.

The present knowledge of the systematics of *Amerizus* subgen. *Tiruka* ANDREWES, 1935 is based mainly on the study of the male genitalia, due to the strong tendency to the convergence in habitus of the species (SCIAKY & TOLEDANO 2007). *Amerizus* (*Tiruka*) *baxiensis* DEUVE, 1998 was formerly known only from the female type specimen. A few males were recently discovered in the collection of Paolo Magrini (Firenze, Italy), therefore the systematic position of this species too can be discussed here.

Material and Methods

This paper is based on the study of about 100 specimens belonging to Palaearctic species of *Bembidion* subgen. *Ocydromus* CLAIRVILLE, 1806 sensu TOLEDANO (2008a) and Chinese species of *Amerizus* subgen. *Tiruka* ANDREWES, 1935.

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The specimens examined are deposited in the following collections:

BMNH	The Natural History Museum, London; Max Barclay, Conrad Gillett
CBPC	Petr Bulirsch collection, Praha, Czech Republic
CMFI	Paolo Magrini collection, Firenze, Italy
CSMI	Riccardo Sciaky collection, Milano Italy
CTMS	Marcos Toribio collection, Madrid, Spain
CTVR	Luca Toledano collection, Verona, Italy
CWBE	David Wrase collection, Berlin, Germany
MHNP	Muséum d'Histoire naturelle, Paris, France; Thierry Deuve, Azadeh Taghavian
NMPC	National Museum, Praha; Jiří Hájek
NMW	Naturhistorisches Museum Wien; Heinrich Schönmann

The measurements, made with a Leica MZ12 stereobinocular microscope at 25 ×, are expressed in the text by these abbreviations:

El/Ew	elytral length / elytral width ratio
El/Pl	elytral length / pronotal length ratio
Ew/Pw	elytral width / pronotal width ratio
Pw/Pl	pronotal width / pronotal length ratio
Tl/Al	total length / antennal length ratio

The body length was measured for card-mounted specimens, from the front margin of the clypeus to the apex of the elytra, the antennal length from the base of antennomere 1 to the apex of 11. The pronotal length in the species with lateral corners of the anterior pronotal margin protruding is measured along the mid-line.

Dissections were made using standard techniques. Genitalia and small parts were preserved in Euparal on acetate or glass labels pinned underneath the specimens.

The photographs are composite images with progressive focusing obtained with a Nikon DSFi1 digital camera controlled by Nikon DS-L2 stand alone remote controller mounted on a Leica Z6 microscope equipped with a 1.0 × Leica lens and a customized motorized stand made by the author, then processed on a Macintosh Mac Book Pro computer with Helicon Focus ® 3.61 program and then optimized with Photoshop® Elements 3.0 on the same computer. Photographs of the aedeagi and body details are made with the same setup and processing method described above, while using a 5 × Infinity Corrected Nikon Fluor lens on the Z6 microscope. The photos of *Caecidium trechomorphum* UÉNO, 1971 and *Amerizus wrzecionkoi* DEUVE, 1998 are single shots (habitus, with 1 × lens) and multiple images (male genitalia, with 5 × lens) taken at MHNP with the setup described above modified for portable use.

The systematic treatment of KRYZHANOVSKIJ et al. (1995) modified by TOLEDANO (2008a) for the subtribe Bembidiina and in particular for the *Ocydromus* CLAIRVILLE, 1806 complex is adopted here.

In the following text, 'type seen' means that I was able to study the type of a given species in the past but not during the compilation of this paper.

Bembidion LATREILLE, 1802 subgen. *Ocydromus* CLAIRVILLE, 1806 sensu TOLEDANO (2008a)

Bembidion (*Ocydromus*) *parepum* JEDLIČKA, 1933
(Figs. 1–4)

MATERIAL EXAMINED: Paratype ♂ "Tatsienlu / Yüling Süd / Szechuan China // Cotype (round, yellow) // Coll. E. Reitter / B.M. 1934-449. // COTYPE (pink) // Bembidion parepum mihi (handwritten) / DET. ING. JEDLIČKA (pink)" (BMNH); paratype ♂ "Tatsienlu / Prov. Setschuan / CHINA MERID. // Cotype (round, yellow) // COTYPE

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(red) // H.E. Andrewes Coll. / B.M. 1945 // Ex Coll. / A. Jedlicka // Bembidion parepum mihi (handwritten) / DET. ING. JEDLIČKA (pink)" (BMNH); holotype (NMPC) seen.

SYSTEMATIC NOTES: This species belongs to the *B. deletum* SERVILLE, 1821 species-group (subgen. *Peryphanes* JEANNEL, 1941 auct.). It was formerly ranked as "*Bembidion* subgen. *Peryphus* STEPHENS (erroneously attributed to this author, instead of DEJEAN, 1821) *parepum* species-group" (NETOLITZKY 1942–1943), as "*Bembidion* subgen. *Peryphus* STEPHENS, 1829 (sic!, see above) *ovale* MOTSCHULSKY, 1844 species-group" (JEDLIČKA 1965), as *Bembidion* incertae sedis (MARGGI et al. 2003) and "subgen. *Ocydromus* incert. – *Peryphus* olim" (LORENZ 2005). TOLEDANO (2008b) provisionally placed this species within the *Ocydromus* s.l. complex in a monospecific species-group because of the external characters. In the light of the study of the male genitalia I can confirm this opinion, but the species shows striking analogies with a species-group as far not yet reported for the Chinese fauna, and distributed mainly in the western Palaearctic Region.

The phallus of *Bembidion parepum* looks peculiar for its characteristic cuneiform external shape. Dorsally to the middle of the endophallus there is a double markedly sclerotized ply of the dorsal membranes which somehow reminds the membranous sac ("membranöser Sack") (MÜLLER-MOTZFELD 1986), the postulated autapomorphic male genitalic character proposed for *Ocyturanes* MÜLLER-MOTZFELD, 1986 by the describer himself, i.e. a cylindrical, tubular sclerite in dorsal position, relatively close to the basal opening of the phallus. Actually, the structure shown by *B. parepum* seems not to be homologous with the membranous sac. But a similar structure is present also in the endophallus of the members of the *deletum* SERVILLE, 1821 (*Bembidion* subgen. *Peryphanes* JEANNEL, 1941 auct.) species-group (Fig. 5, detail of the basal sclerites of *B. deletum* seen from the right side). In the apical half of the endophallus of *B. parepum* there is a particularly developed sclerite, a second, ventral flagellum, visible from both sides, which originates at middle of the aedeagus from a flat, large and well sclerotized tubular structure somehow connected with the apical margin of the central brush. Recently, NERI & VIGNA TAGLIANTI (2010) proposed a comparison of the different names used by the former authors for the sclerites in the endophallus of the subgenera *Peryphanes*, *Ocyturanes* and *Peryphus*. The tubular structure mentioned above almost certainly is homologous to the "sclerite laterale" (NERI & VIGNA TAGLIANTI 2010), and the second flagellum should be homologous to the "lama paracopulatrice" (NERI & VIGNA TAGLIANTI 2010) (literally, "paracopulatrix blade"). The presence of both sclerites, together with that of the main flagellum ("sclerite principale" (= main sclerite) NERI & VIGNA TAGLIANTI 2010) and the protrusion of the endophallus from the basal opening are characters present in the *deletum* group (Fig. 5). The slight basal protrusion of the endophallus in *B. parepum* is present in both examined paratypes, therefore it seems not to be an artifact caused during dissection.

The *deletum* group has no members, thus far, reported from China, but the similarities in the endophallus with *B. parepum* are striking. Even though, at least for biogeographical reasons, probably it would be right to keep *B. parepum* in a monopecific species-group, from the taxonomic point of view in my opinion the species can be attributed to the *deletum* species-group. If on the other hand we follow a systematic settlement which regards *Peryphanes* as a good subgenus of *Bembidion*, the species should be certainly attributed to this subgenus. Another Oriental species, *Bembidion hikosanum* HABU & UÉNO, 1955, seems to show similar male genitalia and perhaps could be suitable for the inclusion in the same group (Paolo Neri, pers. comm.). Both observations seem to suggest that the *deletum* group is not restricted to the western Palaearctic Region. Furthermore, even though most species of this group show unicolorous elytra, at least in two cases (*B. dalmatinum haupti* REITTER, 1908 from Caucasus, Turkey, Iran, and *B. morvanianum* MÜLLER-MOTZFELD, 1986 from Iran) large apical spots are present.

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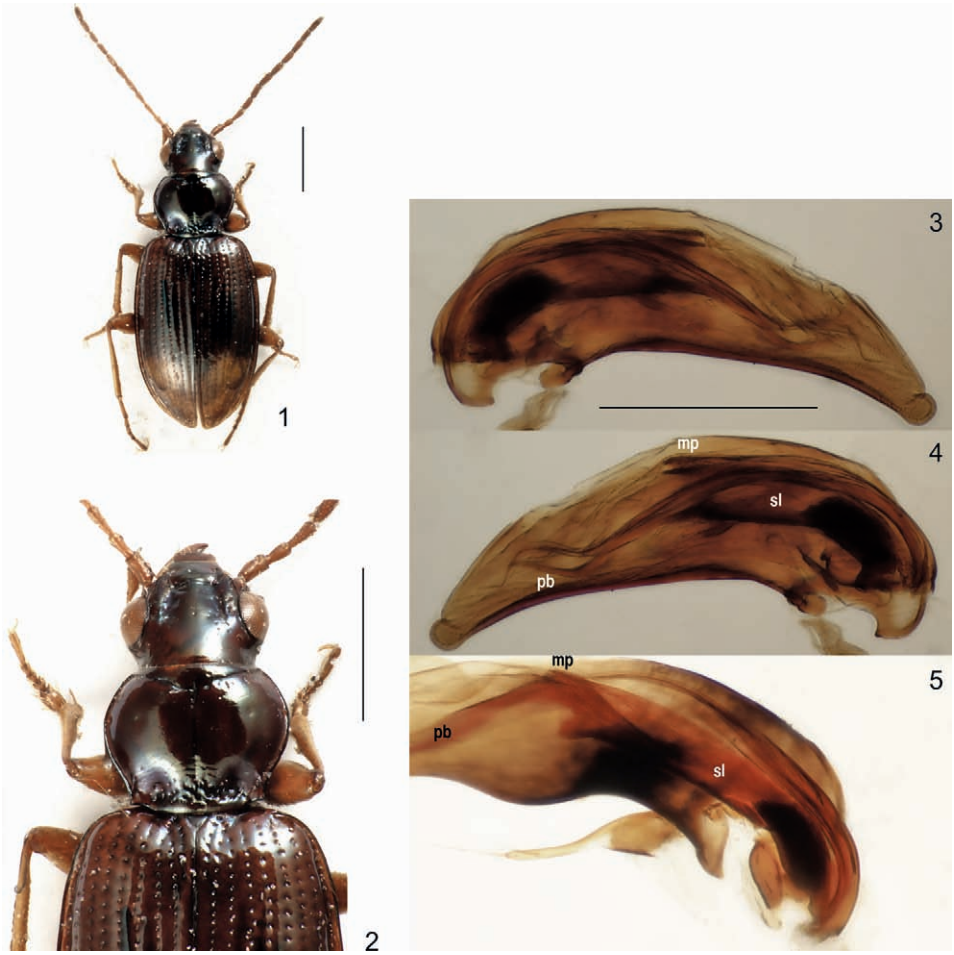

Figs. 1–2: *Bembidion parepum* (paratype, BMNH), (1) habitus, (2) head and pronotum. Scale = 1 mm.

Figs. 3–4: Median lobe of aedeagus of *Bembidion parepum* (paratype, BMNH) in left (3) and right (4) view.

Fig. 5: *Bembidion deletum* from Poland (CTMS), median lobe of the aedeagus, in right view.

Abbreviations: sl = lateral sclerite, pb = paracopulatrix blade, mp = double ply of membranes.
Scale = 0.5 mm

DIAGNOSIS: A brown *Ocydromus* sensu TOLEDANO (2008a) from Sichuan with yellowish elytral apex, dark red appendages, without microsculpture on elytra and pronotum and with transverse pronotum showing deep basal foveae; endophallus slightly protruding from the basal opening and showing a well developed lateral sclerite and paracopulatrix blade.

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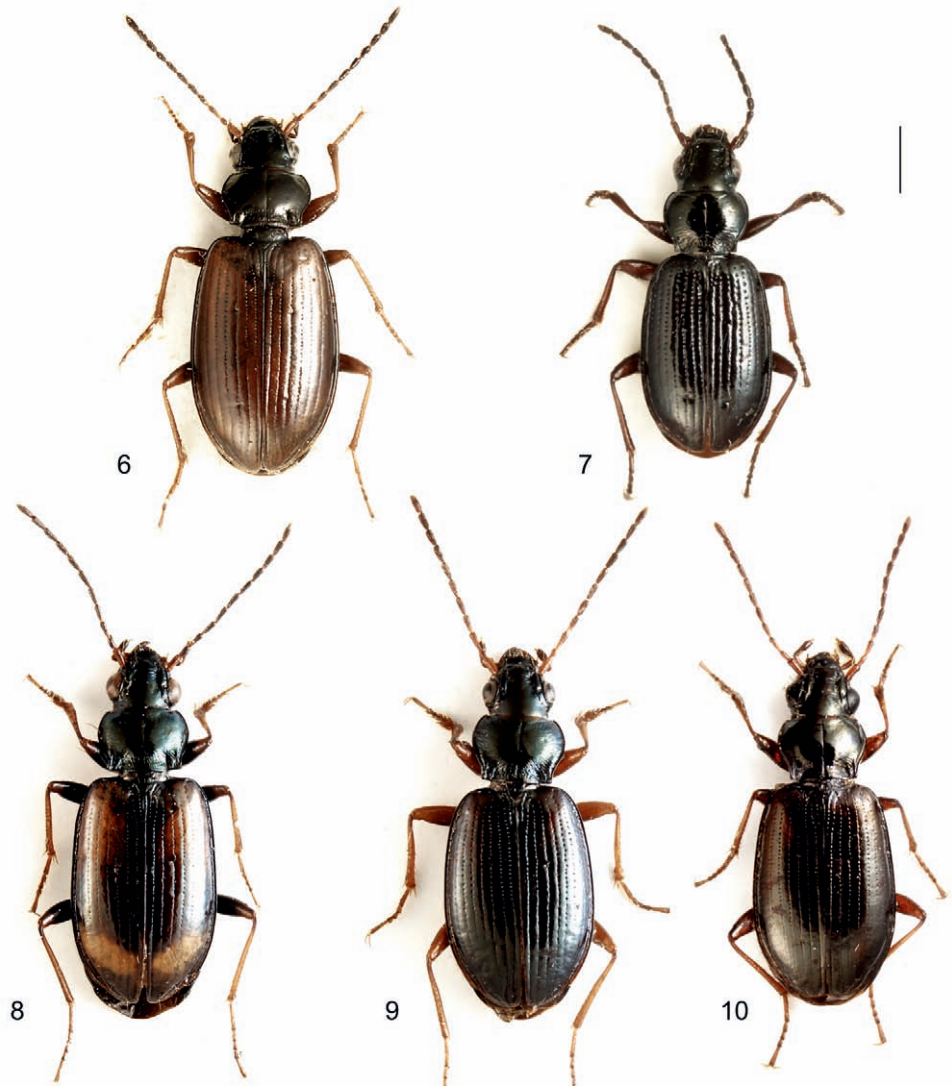

Figs. 6–10: Habitus of (6) *Bembidion magrinii* (paratype, CTVR); (7) *B. heineri* (holotype, CTVR); (8) *B. straussi* (Iran, Prov. Esfahan, CTVR); (9) *B. straussi iridipiceum* (Kyrgyzstan, Ferghana, CTVR); (10) *B. straussi gurwani* (Mongolia, Gobi-Altai, CTVR); scale = 1 mm.

REDESCRIPTION: Length 4.72–4.80 mm, head and pronotum piceous, elytra brown with apical third showing a big yellow spot as wide a the entire elytron, almost reaching apex, covering the whole apical third. Legs light brown, antennae, palpi and tarsi reddish.

Head normal with uneven, parallel frontal furrows not extending on clypeus and showing fine punctures here and there, mostly at their basal end, about in correspondence with the middle of eyes. Eyes normally convex, mandibles and antennae (Tl/Al = 1.87–1.93) normal.

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Pronotum (Fig. 2), (Pw/Pl = 1.29; El/Pl = 3.04–3.08; Ew/Pw = 1.54), transverse, cordate, convex, markedly rounded at sides, evidently sinuate before the short, sharp and slightly acute hind angles. Basal margin emarginate at sides for 1/6 of its total length. Basal margin almost as wide as the anterior one. Anterior pronotal angles not protruding from anterior margin, anterior transverse impression deep, median line superficial, transverse basal impression rather deep and coarsely punctured, somewhat rounded basal foveae less punctured than the transverse basal impression. Laterobasal carina sharp.

Elytra (El/Ew = 1.52–1.54) convex, with rounded sides, well marked shoulders and somewhat pointed apex. Elytral striae 1–7 deep, coarsely punctate, more superficial toward apex, but completely visible, two discal pores in the third interval adjoining stria 3, scutellar stria long. Apical stria very superficial, represented by a row of superficial punctures connected with the superficial apical end of stria 7.

Legs rather short.

Metaventral process evidently bordered.

Microsculpture practically absent on the whole body.

Male genitalia (Figs. 3–4). Median lobe of the aedeagus cuneiform, maximum width about at basal third, then narrowing toward the evidently rounded apex. Basal portion of endophallus, including the oval, large, well sclerotized central brush, protruding a little from basal opening. Tubular flagellum dorsally surrounding the central brush, curved in its basal three-quarters and then somewhat waved in its apical quarter. Another flagellum (paracopulatrix blade), more or less parallel to the main one, beginning at the middle of the aedeagus from a large, flat sclerotized tube (lateral sclerite) appearently connected with the apical portion of the central brush. Flat basal sclerite (ventral sclerite) in ventral position in respect to the base of the central brush.

AFFINITIES: Apparently isolated in the Chinese and neighbouring faunas, *B. parepum* seems related to the western Palaearctic species of the *deletum* group but, on the other hand, among these species it has no strict relatives from both perspectives of habitus and male genitalia.

DISTRIBUTION: So far known only from Yüling and Tatsienlu (ancient name for the town Kangding), China, Sichuan Province.

Bembidion (*Ocydromus*) *straussi* NETOLICKY, 1920 group (= *Peryphus* DEJEAN, 1821 partim)

SYSTEMATIC NOTES: NETOLITZKY (1942–1943) in the key for the species-groups belonging to the subgen. *Peryphus* dealt with *B. straussi* NETOLITZKY, 1910 (type, NMW, seen) independently from the other groups, i.e. as single member of a group within the subgenus. Later, also regarding the other subspecies of *B. straussi* more recently discovered (*B. straussi iridipiceum* FASSATI, 1957, *B. straussi gurwani* JEDLIČKA, 1968 and *B. straussi iridicyaneum* BELOUSOV & MICHAILOV, 1990) KRYZHANOVSKIJ et al. (1995) followed more or less the same settlement, while using the older available subgeneric name *Ocydromus* instead of *Peryphus*. More recently, LORENZ (1998, 2005) and MARGGI et al. (2003) attributed the species of the *straussi* group to *Peryphus* which was intended not according to NETOLITZKY's (1942–1943) perspective, but in the strict sense, as a subgenus of *Bembidion* independent from *Ocydromus* (the name *Ocydromus* was used in these papers for the species of the *Ocydromus* s.str. only). The difference in the treatment of the group between NETOLITZKY (1942–1943) and KRYZHANOVSKIJ et al. (1995) in respect to the other three more recent papers mentioned above is in the way of interpretation of the *Ocydromus* (or *Peryphus*, in NETOLITZKY 1942–1943) complex. TOLEDANO

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(2000, 2008a) has already explained the reasons for refraining from any subgeneric fragmentation of the *Ocydromus* complex.

***Bembidion* (*Ocydromus*) *magrinii* sp.n.**
(Figs. 6, 11, 13–14)

TYPE LOCALITY: China, eastern Qinghai Province, Ngola Shan mts., Surong, 3700 m.

TYPE SERIES: Holotype ♂, "China Qinghai or., Ngola-Shan mts. 3700m, Surong, 1-2.VII.1998, L. Bieber lgt. (CTVR)". Paratypes, 5 ♂♂, 4 ♀♀, same collecting data as the holotype (CBPC, CMFI, CTVR); 1 ♂, 1 ♀, "China Qinghai or., Ngola Shan, Na Hai Shue, 288 km of Sining, m.4500, 18-7-94, leg. Bieber" (CSMI); 2 ♂♂, 1 ♀, "China, Qinghai reg., 3500m, 120 km W of Qinghai Hu, Tianjun, 3-4.7.1990" (CTVR, NMW).

DIAGNOSIS: Near *B. straussi* (Figs. 8, 15–16) from China, Qinghai, recognizable from the lighter specimens of *B. straussi iridipiceum* (Fig. 9) by the more convex elytra, more parallel sides, and the shorter aedeagus.

DESCRIPTION: Length 4.86–5.24 mm, head and pronotum piceous-black with metallic, greenish reflections, elytra light brown, rather matt, legs reddish-brown, whole antennomere 1, base and apex of 2, 3 and 4 red, rest of antenna infuscated.

Head rather small, frontal furrows parallel, uneven, corrugated, not extending on clypeus, with few fine punctures at their basal end. Eyes normally convex, mandibles and antennae (Tl/Al = 2.13–2.17) normal.

Pronotum (Fig. 11) (Pw/Pl = 1.35–1.37; El/Pl = 3.35–3.54; Ew/Pw = 1.64–1.67) transverse, depressed, well rounded at sides in the anterior four-fifths, then evidently sinuate at sides before the long (about one-fifth of the whole pronotal length) right hind angles. Basal margin slightly wider than the anterior one. Anterior angles not protruding from anterior margin, basal margin slightly arcuate, anterior transverse impression and median line superficial, basal transverse impression rather deep, rugose-punctate, with small and deep basal foveae. Laterobasal carina rudimentary but present; in few specimens very difficult to see.

Elytra (El/Ew = 1.51–1.54) convex, with square shoulders and gently rounded sides and apex. Elytral striae 1–7 complete, rather superficially punctate-sulcate, reaching apex. Scutellar stria long, apical stria connected with the apical end of stria 5. Two discal elytral pores in the third interval, almost exactly on stria 3.

Legs normal.

Metaventral process bordered.

Microsculpture almost isodiametric on neck and clypeus, absent on the frons and on the pronotal disk, slightly more transverse but rather superficial on the pronotal sides and base, more evident on the whole elytra, where the sculpticells are slightly transverse in the male specimens, almost isodiametric in the females.

Male genitalia (Figs. 13–14). In the *straussi* group the endophallus is rather simple, with a well sclerotized central brush, rather large lateral sclerite (for the terminology of the sclerites see NERI & VIGNA TAGLIANTI 2010); basal sclerite well sclerotized, mainly on its ventral margin. A relatively short, sinuate flagellum is always present, together with a variously developed ostial flag. *Bembidion magrinii* has the median lobe of the aedeagus more markedly sclerotized than in the other species of the *straussi* group. In respect to *B. straussi* (Figs. 15–16) the median lobe is evidently shorter and more stout, the flagellum is shorter and the ostial flag is evidently wider.

AFFINITIES: Certainly strictly related to *Bembidion straussi* and *B. heineri* as shown by the shared characters of the endophallus.

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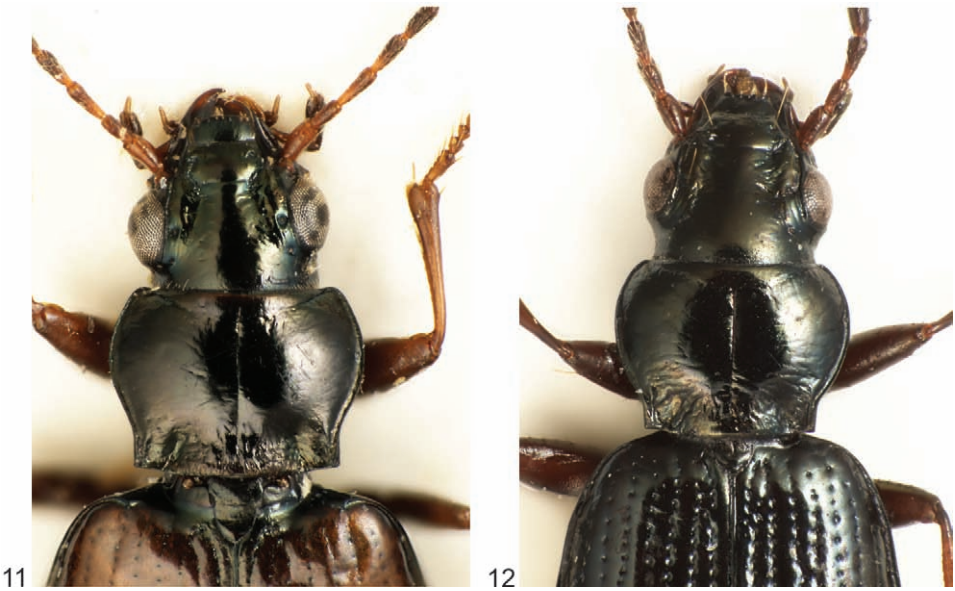

Fig. 11–12: Head and pronotum of (11) *Bembidion magrinii* (paratype, CTVR) and (12) *B. heineri* (holotype, CTVR).

DISTRIBUTION: China, Qinghai Province, where it lives at high altitudes (3700–4500 m).

DERIVATIO NOMINIS: The species name is dedicated to my dear friend Paolo Magrini, my colleague both in entomology and in dentistry, who kindly gave me to study one specimen of the type series of this species and other interesting specimens dealt with in this paper.

***Bembidion* (*Ocydromus*) *heineri* sp.n.**
(Figs. 7, 12, 21–22)

TYPE LOCALITY: China, Xinjiang, Tian Shan pass 3500 m road Kuga – Bayanbulak, 80 km SW Bayanbulak.

TYPE SERIES: Holotype ♂, "China, Xinjiang, Tian Shan pass 3500m road Kuga-Bayanbulak 80 km SW Bayanbulak, J. Turna leg. 10-12/VII/1993" (CTVR). Paratypes: 1 ♀, same collecting data as the holotype (NMW); 1 ♀: "NW China, Xingjiang prov., E Tian - Shan mts., pass 100 Km S of Bayanbulak, S side, 3150-3500 m, 7-9.VII.2006, S Murzin leg." (CWBE).

DIAGNOSIS: Near *B. straussi gurwani* (type, NMPC, seen) with smaller eyes, deeper elytral punctures, darker antennae and shorter flagellum of endophallus.

NOTE: The mention of *B. straussi gurwani* (Figs. 10, 19–20) for China, Xinjang (TOLEDANO 2008b) has to be considered erroneous, due to my former misidentification of the specimens of the type series of *B. heineri*. The distribution of *B. straussi gurwani* seems to be restricted to Eastern Siberia and Mongolia, as correctly indicated by MARGGI et al. (2003).

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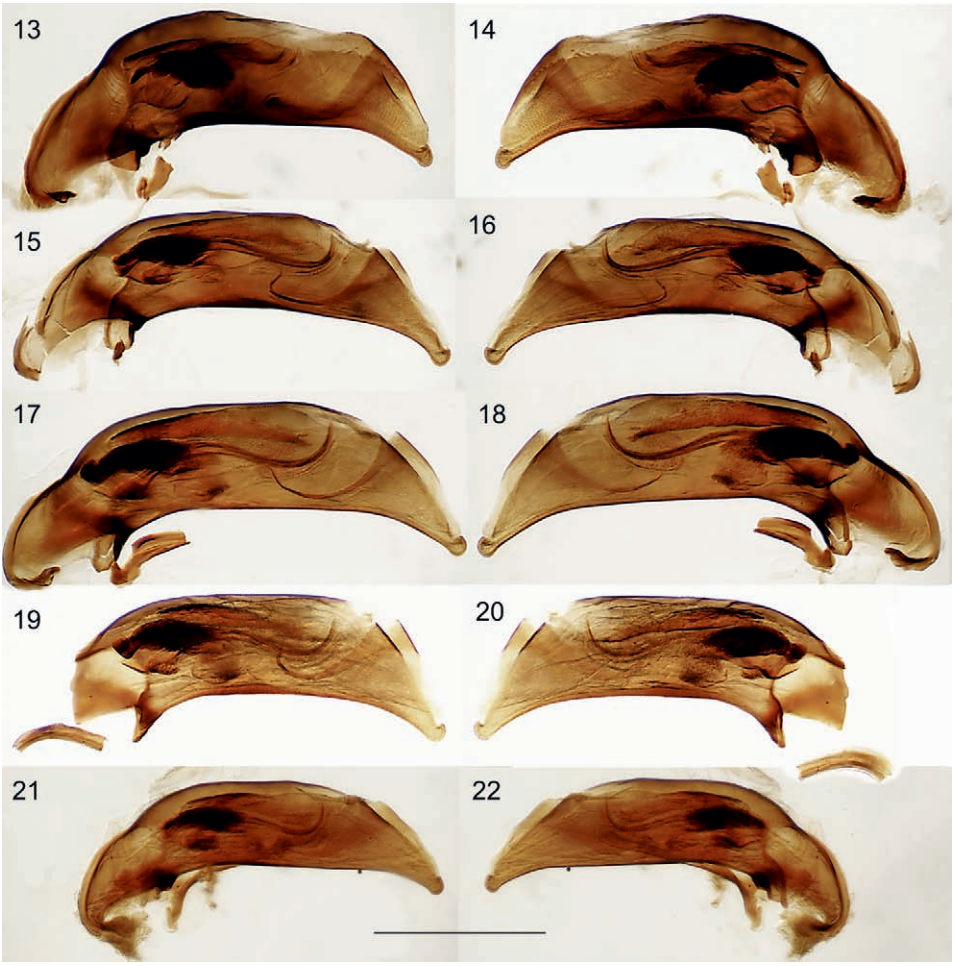

Figs. 13–22: Median lobe of aedeagus of *Bembidion magrinii* (holotype) in left (13) and right (14) view; of *B. straussi* (Iran, Prov. Esfahan, CTVR) in left (15) and right (16) view; of *B. straussi iridipiceum* (Kyrgyzstan, Ferghana, CTVR) in left (17) and right (18) view; of *B. straussi gurwani* (Mongolia, Gobi-Altai, CTVR) in left (19) and right (20) view; of *B. heineri* (holotype, CTVR) in left (21) and right (22) view; scale = 0.5 mm.

DESCRIPTION: Length 4.50–4.56 mm, dorsal surface entirely piceous black with metallic, greenish reflections. Legs and antennae brown, except for the red basal articulation of antennomeres 2–4. Penultimate articles of palps darker.

Head small with eyes small and flat, frontal furrows parallel and uneven, rugose, not extending on clypeus, antennae short (Tl/Al = 2.07–2.08).

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Pronotum (Fig. 12) (Pw/Pl = 1.36–1.39; El/Pl = 3.13–3.30; Ew/Pw = 1.53–1.63) cordate, small, transverse, depressed, well rounded at sides, evidently sinuate before the right hind angles (about as long as one fifth of the whole pronotal length). Basal margin as long as the anterior one. Anterior angles not protruding from anterior margin. Anterior transverse impression and median line superficial, basal transverse impression wide, not deep, coarsely rugose, with wide and superficial basal foveae and evident laterobasal carina. Basal margin very slightly emarginate at sides, just before the sharp hind angles. Whole pronotal surface slightly corrugated, more evidently in the posterior half.

Elytra (El/Ew = 1.45–1.50) rather depressed, gently rounded at sides, with maximum width evidently behind middle, rounded shoulders and rounded apex. Elytral striae 1–4 coarsely punctate-sulcate in the basal three fourths, then progressively more superficial, only stria 1 evidently reaching apex. Striae 5–7 more superficially punctate, not sulcate, almost disappearing at the apical quarter. Scutellar stria rather short, apical stria short and superficial, slightly sulcate, connected with the trace of the apical end of stria 7. Two discal elytral pores in the third interval, adjoining stria 3.

Legs short.

Metaventral process bordered.

Microsculpture almost absent on head, except for the isodiametric sculpticells on the neck, superficial, in slightly transverse sculpticells here and there on the pronotum, more evident in the basal foveae, superficial, with very flat, polygonal sculpticells of variable width, irregularly distributed, on elytra.

Male genitalia (Figs. 21–22). Median lobe of aedeagus with apex slightly shorter and more stout than in *B. straussi*. Endophallus very similar to that of *B. straussi* with shorter flagellum than in this last.

AFFINITIES: Certainly strictly related to *B. straussi* as shown by the characters of the endophallus, in particular with its Oriental subspecies *gurwani*.

DISTRIBUTION: Known from the type locality only.

DERIVATIO NOMINIS: The species is dedicated, for his retirement, to my dear friend Heiner Schönmann, former Curator of the Coleoptera-Section (NMW), a very nice man who collaborated with his help to most of my studies with kindness and patience.

Amerizus CHAUDOIR, 1868 (subgen. *Tiruka* ANDREWES, 1935)

SYSTEMATIC NOTES: Unfortunately it is still problematic to define the phylogenetical relationships within this extremely complex group. The first attempt was made by SCIAKY & TOLEDANO (2007), who provided material for a future revision, proposing an internal division of the subgenus in species-groups based mainly on the endophallic features, in part based on the observation of fresh material, in part literature-based. I was recently able to study at MHNP the type material of most species described by DEUVE (1998, 2002) himself and to confirm the diagnoses for these species given in SCIAKY & TOLEDANO (2007). Nevertheless, the extreme complexity due to the tendency to endemism of the species, together with the tendency to convergence in habitus of species of different groups (showing on the other hand evident differences in the endophalli) still prevents from giving a key to identification of the species based on the external characters and from using some of these last for phylogenetic analysis. Therefore it still remains extremely difficult to identify with certainty female specimens, except

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for few species, and to state where the intraspecific variability ends and where the specific distinction begins. Also a slight difference in the external shape of phalli in different populations, which in other groups of the Bembidiina can be certainly regarded as intraspecific variability, in the case of the *Tiruka* seems to mean genetical isolation, and, therefore, specific independence.

The systematic arrangement of the Chinese species of the subgenus followed here is the same as proposed in SCIAKY & TOLEDANO (2007), with the division in five groups: 1) *schmidti* group (*schmidti* SCIAKY & TOLEDANO, 2007); 2) *queinneci* group (*baxiensis* DEUVE, 1998, *davidales* SCIAKY & TOLEDANO, 2007, *mourzinei* DEUVE, 1998, *panda* SCIAKY & TOLEDANO, 2007, *puetzi* SCIAKY & TOLEDANO, 2007, *queinneci* DEUVE, 1998, *shatanicus* DEUVE, 2004, *songpanensis* DEUVE, 1998, *wolongensis* DEUVE, 2002); 3) *lama* group (*lama* SCIAKY & TOLEDANO, 2007); 4) *markamensis* group (*barkamensis* DEUVE, 1998, *farkaci* SCIAKY & TOLEDANO, 2007, *gongga* DEUVE, 1998, *markamensis* DEUVE, 1998, *turnai* DEUVE, 1998); 5) *hubeiensis* group (*hubeiensis* DEUVE, 2002, *perraulti* DEUVE, 1998). The monospecific *schmidti* group is characterized by peculiar external characters (elytral hirsutism). Unfortunately, information regarding the endophallus is still lacking, because the species has never been collected again and the slide of the aedeagus of the specimen (possibly preserved separately from the specimen, a very dangerous practice) was probably lost some time ago. My attempts to find it in museums and private collections have proved unsuccessful. In any case, for this species the external differences in habitus are so peculiar that the species still has to be considered as belonging to an independent group. For all the other species the division is endophallus-based. For *A. wrzecionkoi* DEUVE, 1998, which I was recently able to see for the first time at MHNP, I propose here a new, independent species-group for a peculiar characteristic of the endophallus (see below). The male genitalia of *A. baxiensis* DEUVE, 1998 are described here for the first time and allow inclusion in the *queinneci* group, while those of *A. gologensis* DEUVE, 2004 still remain unknown and those of *A. maquensis* DEUVE, 2004 and *A. tiani* DEUVE, 2004 still are known to me only from the literature. Also *A. shatanicus* DEUVE, 2004 was found again (CMFI), therefore for this species I was able to provide direct investigation, and confirm its inclusion in the key, formerly based only on literature data (SCIAKY & TOLEDANO 2007). By the way the specimens kindly provided for study by Paolo Magrini demonstrate also for the first time the sympatry of *A. baxiensis* with *A. shatanicus*, formerly known only from their type localities, both not too far from the locality where the specimens I have examined here were collected.

After examination of two specimens of *Caecidium trechomorphum* UÉNO, 1971 (Figs. 23–24) deposited in the MHNP I can confirm the hypothesis proposed in SCIAKY & TOLEDANO (2007) regarding the affinities of the genera *Caecidium* UÉNO, 1971 and *Amerizus*. The similarities in the external characters (habitus, shape of head, mandibles and pronotum) seem to confirm their affinities, apparently not depending by convergence only; unfortunately I have not yet detailed information regarding the endophallus because both specimens I have examined in Perrault's Collection (MHNP) were females. One thing must anyway be said in order to correct the following sentence from SCIAKY & TOLEDANO (2007): "Perhaps also *Caecidium* could be included in the transpacific complex of supraspecific groups probably strictly related to each other formed by *Amerizus* s.str. (North America), *Amerizus* subgen. *Tiruka* (Nepal to southwestern China) and *Gnatholymnaeum* SHARP, 1903 (Hawaii)": according to LIEBHERR (2008) *Gnatholymnaeum* is a subgenus of *Bembidion* and its similarities with *Amerizus* are due to convergence only.

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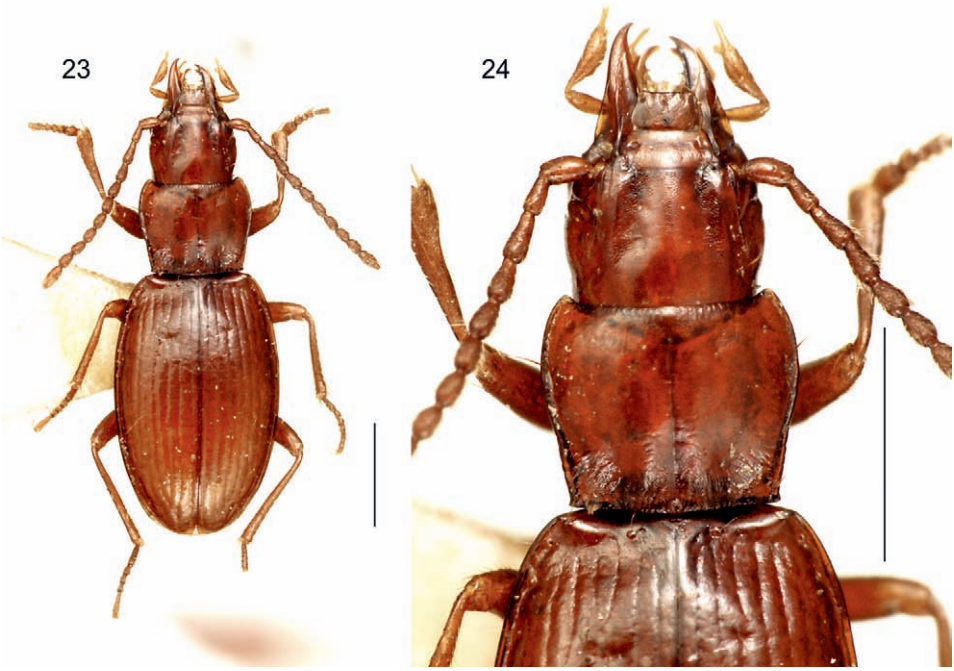

Figs. 23–24: *Caecidium trechomorphum* (paratype, MHNP), 23) habitus and 24) head and pronotum. Scale = 1 mm.

Additions to the provisional key to the Chinese species of *Amerizus* subgen. *Tiruka* (SCIAKY & TOLEDANO 2007)

The following couplets of the key should be added to the former one (SCIAKY & TOLEDANO 2007) by substitution of the couplet no. 19 and addition of a new one at no. 20.

19 Slightly larger in size (4.98–5.04 mm) ..... *A. puetzi* SCIAKY & TOLEDANO, 2007

– Slightly smaller (4.34–4.96 mm) 20

20 Aedeagus slightly larger with ventral margin slightly less arcuate and apex stout; slightly larger size (4.64–4.96 mm), with slightly less transverse pronotum (pw/pl = 1.15–1.17), with slightly more clearly impressed elytral striae, lighter, brown colour of dorsal surface and antennomeres more elongate and light ..... *A. shatanicus* DEUVE, 2004

– Aedeagus slightly smaller with ventral margin more arcuate and apex narrow; slightly smaller size (4.34–4.56 mm), slightly more transverse pronotum (pw/pl = 1.18–1.19), with slightly more superficial elytral striae, darker, piceous colour of dorsal surface and antennomeres shorter and slightly darker ..... *A. baxiensis* DEUVE, 1998

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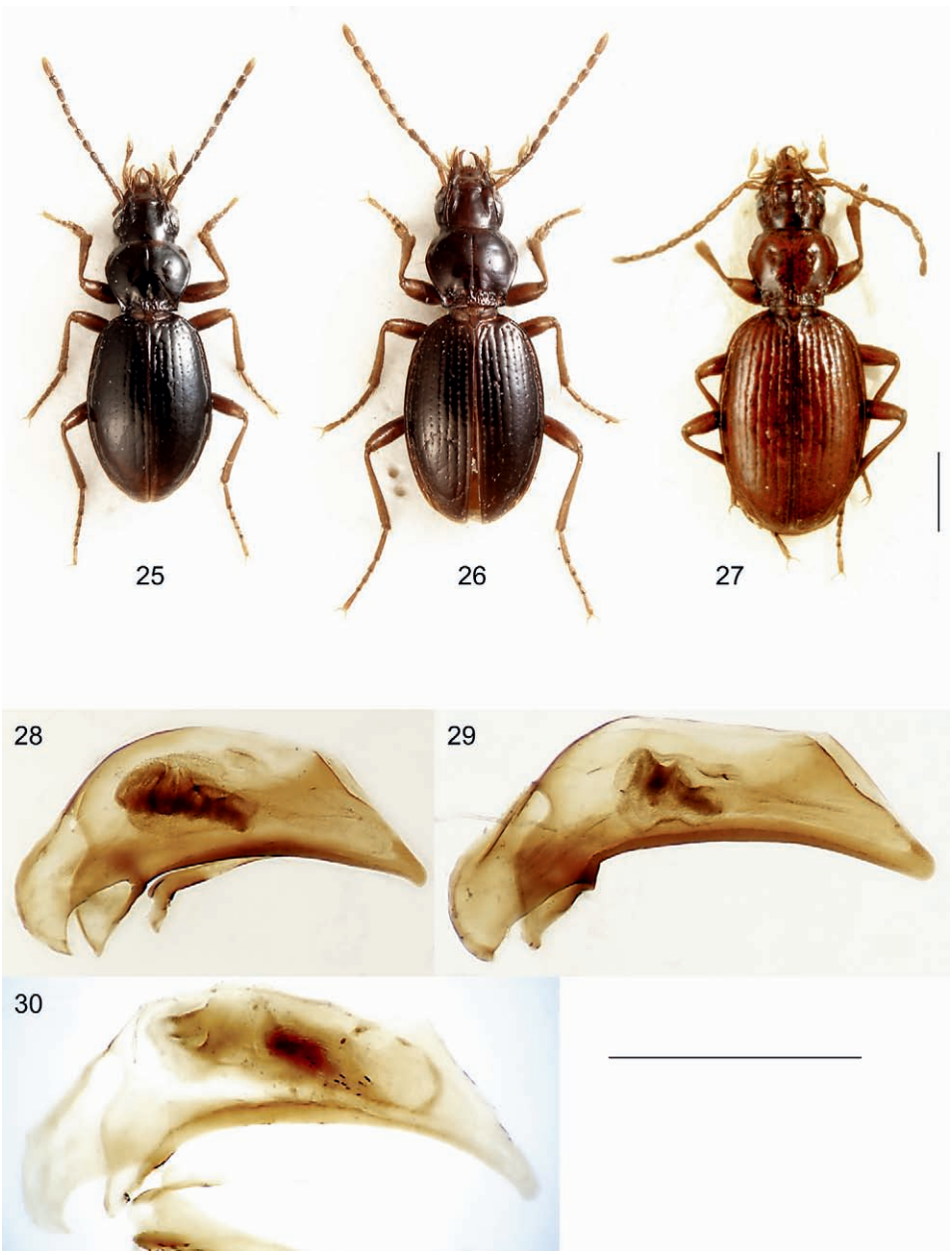

Figs. 25–27: Habitus of 25) *Amerizus baxiensis* (China, Sichuan, Maeirma, CTVR), 26) *A. shatanicus* (China, Sichuan, Maeirma, CTVR) and 27) *A. wrzecionkoi* (holotype, MHNP); scale = 1 mm.

Figs. 28–30: Median lobe of aedeagus of (28) *Amerizus baxiensis* (China, Sichuan, Maeirma, CTVR) and (29) *A. shatanicus* (China, Sichuan, Maeirma, CTVR) and (30) *A. wrzecionkoi* (holotype, MHNP); scale = 0.5 mm.

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Amerizus (*Tiruka*) *baxiensis* DEUVE, 1998
(Figs. 25, 28)

MATERIAL EXAMINED: Type (MHNP) seen; 2 exs., China, NW Sichuan, Maeirma, 40 km SE of Aba, 3200 m, shrubs, 9.–29.VI.2004, leg. Fabbri (CMFI, CTVR).

SYSTEMATIC NOTES: This species belongs to the *A. queinneci* DEUVE, 1998 species-group. Male genitalia (Fig. 28). In the endophallus of *A. baxiensis* there is a single visible sclerite, the "kernel sclerite" (SCIAKY & TOLEDANO 2007) as in all members of the *A. queinneci* group. The differences between the species of the group are restricted to details of the aedeagal external shape (see key for species in SCIAKY & TOLEDANO 2007). The male genitalia of *A. baxiensis* are recognizable from those of the sympatric *A. shatanicus* because the aedeagus of *A. baxiensis* is longer, with less curved ventral margin and with apex shorter and more stout.

Amerizus (*Tiruka*) *shatanicus* DEUVE, 2004
(Figs. 26, 29)

EXAMINED MATERIAL: 5 exs., China, NW Sichuan, Maeirma, 40 km SE of Aba, 3200 m, shrubs, 9.–29.VI.2004, leg. Fabbri (CMFI, CTVR).

Amerizus (*Tiruka*) *wrzecionkoi* DEUVE, 1998
(Figs. 27, 30)

SYSTEMATIC NOTES: The endophallus of *A. wrzecionkoi* (Fig. 30: holotype, MHNP) shows the kernel sclerite only, and lacks the pack of scales and other sclerites, therefore, according to the classification proposed by SCIAKY & TOLEDANO (2007) the species should be included in the *queinneci* species-group. But it shows a peculiar border surrounding the "kernel sclerite" (SCIAKY & TOLEDANO 2007) due to a strong sclerotization of the endophallic membranes which is absent in all the remaining Chinese species of the subgenus. As mentioned above, in this genus, also slight genital differences seem to have systematic relevance, therefore the peculiarity of this species suggests that it is isolated within the Chinese species of the subgenus and therefore it has been attributed here to a monospecific species-group.

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