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**Notes on some species of the genus *Bembidion* Latreille, 1802,
subgenus *Chlorodium* Motschulsky, 1864**

(Insecta: Coleoptera: Carabidae: Bembidiina)

Abstract

Some taxonomic, geographical and synonymous aspects of the genus *Bembidion* Latreille, 1802 subgenus *Chlorodium* Motschulsky, 1864, group “with pronotum at least in part microsculptured” are discussed here. Synonymies proposed in this paper (with junior synonym listed first): *Bembidion (Chlorodium) quailaicum* Kirschenhofer, 1984 syn.n. of *Bembidion (C.) luridicorne luridicorne* Solsky, 1874 and *Bembidion (C.) wittmeri* Basilewsky, 1979 syn.n. of *B. (C.) luridicorne lamprinum* Reitter, 1895, *B. (Neja) anatolicum* Jedlicka, 1968 syn.n. of *B. (Chlorodium) splendidum pincum* De Monte, 1957 and *B. (Neja) torosum* Marggi & Huber, 1999 syn.n. of *B. (Chlorodium) splendidum pincum* De Monte, 1957. Regarding *B. (C.) luridicorne lamprinum* Reitter, 1895 its nomenclatorial status is confirmed, its geographical distribution is updated and the differences with the nominotypical form *B. (C.) luridicorne luridicorne* Solsky, 1874 are pointed out. The nomenclatorial status of *B. (C.) splendidum pincum* De Monte, 1957 is confirmed, *B. (C.) luteipes* Motschulsky, 1844 and *B. (C.) elbursicum* Netolitzky, 1939 are downgraded to subspecies of *splendidum*; the differences between *B. (C.) splendidum splendidum* Sturm, 1825 and *B. (C.) splendidum pincum* De Monte, 1957 are also pointed out and the geographical distribution of the species is updated; the presence of *splendidum splendidum* Sturm, 1825 in Syria and Egypt is deleted. The differences between *B. (C.) splendidum luteipes* Motschulsky, 1844 and *B. (C.) splendidum elbursicum* Netolitzky, 1939 are made clear, lectotype and paralectotype of *B. (C.) elbursicum* Netolitzky, 1939 are designated and the distribution of the subspecies is discussed, mainly regarding Israel and Iraq. A new key for the identification of the species of the group is also provided, in Italian and English.

Key words: *Bembidion*, *Chlorodium*, *Neja*, synonymy, taxonomy, lectotype and paralectotype designation, Afghanistan, Iraq, Syria, Israel, Egypt, United Arab Emirates, identification keys.

Riassunto

[*Note su alcune specie del genere Bembidion Latreille, 1802, subgenere Chlorodium Motschulsky, 1864 (Insecta: Coleoptera: Carabidae: Bembidiina)]*

Sono discussi alcuni aspetti tassonomici, geografici e sinonimici del genere *Bembidion* Latreille, 1802 sottogenere *Chlorodium* Motschulsky, 1864, gruppo “con pronoto almeno parzialmente reticolato”. Sono messi in sinonimia *Bembidion (Chlorodium) quailaicum* Kirschenhofer, 1984 con *B. (C.) luridicorne luridicorne* Solsky, 1874; *B. (C.) wittmeri* (Basilewsky, 1979) con *B. (C.) luridicorne lamprinum* Reitter, 1895; *B. (Neja) anatolicum* Jedlicka, 1968 con *B. (Chlorodium) splendidum pincum* De Monte, 1957.

pincum De Monte, 1957; *B. (Neja) torosum* Marggi & Huber, 1999 con *B. (Chlorodium) splendidum pincum* De Monte, 1957. Viene confermato lo status di *B. (C.) luridicorne lamprinum* Reitter, 1895, aggiornata la distribuzione della specie e messe in evidenza le differenze tra *B. (C.) luridicorne luridicorne* Solsky, 1874 e *B. (C.) luridicorne lamprinum* Reitter, 1895. Viene confermato lo status di *B. (C.) splendidum pincum* De Monte, 1957; *B. (C.) luteipes* Motschulsky, 1844 e *B. (C.) elbursicum* Netolitzky, 1939 sono declassate a sottospecie di *splendidum*; sono messe in evidenza le differenze tra *B. (C.) splendidum splendidum* Sturm, 1825 e *B. (C.) splendidum pincum* De Monte, 1957 e aggiornata la distribuzione della specie; è depennata la presenza di *splendidum splendidum* Sturm, 1825 in Siria ed Egitto. Vengono chiarite le differenze tra *B. (C.) splendidum luteipes* Motschulsky, 1844 e *B. (C.) splendidum elbursicum* Netolitzky, 1939, designati lectotypus e paralectotypus di *B. (C.) elbursicum* Netolitzky, 1939 e discussa l'area di distribuzione della sottospecie, soprattutto per Israele ed Iraq.

Infine è fornita una nuova chiave d'identificazione per le specie del gruppo, in italiano ed inglese.

Introduction

During the study of some species of *Bembidion* Latreille, 1802 belonging to the subgenus *Chlorodium* Motschulsky, 1864, with pronotum at least in part microsculptured, we discovered that the rank of some taxa must be revised, that the distributional patterns of some subspecies are not well defined, that the keys available in the literature are not too clear and that some species must be synonymized. Furthermore we ascertained that *Bembidion anatolicum* Jedlicka, 1968, at present attributed to the subgenus *Neja* Motschulsky, 1864, actually belongs to the subgenus *Chlorodium*. Therefore we decided to study in depth the species of subgenus *Chlorodium* in particular isolating a species group “with pronotum at least in part microsculptured”, in order to try to solve the discovered problems and produce a new key for the identification.

Materials and methods

We were able to examine external characters, male genitalia (except for *B. quailaicum* Kirschenhofer, 1984 and *B. loricatum* Andrewes, 1922), the relevant literature of all the species belonging to the subgenus *Chlorodium*, group “with pronotum at least in part microsculptured”; the examined specimens were more than 550.

The microsculpture is defined “irregular” when showing almost isodiametric sculpticells together with short, transverse polygonal sculpticells (MÜLLER-MOTZFELD & MARGGI, 2011 p. 115).

The body length was measured for card-mounted specimens from the front margin of the clypeus to the apex of the elytra. Dissections were made using standard techniques. Genitalia and small parts were preserved in Euparal on acetate mounts fixed on the same pins as the specimens.

During this study, except for *B. pygmaeum* Fabricius, 1792, we found no evidence

of important diagnostic characters on the male genitalia, due to the extreme similarity of the aedeagi.

The systematic treatment of the Bembidiina and the geographical acronyms follow MARGGI et al. (2017).

The photographs of habitus and detail of pronota were made by LucaToledano with Nikon DSFi1 and Nikon DS-L2 on Leica Z6 and those of the male genitalia by Gabriele Fiumi with Nikon D300 on Leitz Dialux 20 EB.

The examined material is preserved in the following collections:

AD	coll. Alexander Dostal, Vienna, Austria
CTVR	coll. Luca Toledano, Verona, Italy
HNHM	Hungarian Natural History Museum, Budapest, Hungary
KR	coll. Karel Rébl, Nove Straseci, Czech Republic
MHB	Museum für Naturkunde, Berlin, Germany
NHMB	Naturhistorisches Museum, Basel, Switzerland
NHMW	Naturhistorisches Museum, Vienna, Austria
NMPC	National Museum (Natural History), Prague, Czech Republic
PN	coll. Paolo Neri, Forlì, Italy
SMNH	Steinhardt Museum of Natural History Tel Aviv University, Tel Aviv, Israel.

CATALOGUE OF THE SPECIES EXAMINED

Bembidion (Chlorodium) luridicorne luridicorne Solsky, 1874 (fig. 4)

Bembidion luridicorne Solsky, 1874: 117

Bembidion (Chlorodium) quailaicum Kirschenhofer, 1984 **n. syn.**

Bembidion (Chlorodium) luridicorne lamprinum Reitter, 1895 (figs. 5, 6, 10)

Bembidion lamprinum Reitter, 1895: 79

Bembidion (Chlorodium) wittmeri (Basilewsky, 1979) **n. syn.**

Chlorodium wittmeri Basilewsky, 1979: 141

Bembidion (Chlorodium) splendidum splendidum Sturm, 1825 (figs. 3, 7, 11)

Bembidion splendidum Sturm, 1825: 145

Bembidion (Chlorodium) splendidum luteipes (Motschulsky, 1844) **n. stat.** (figs. 1, 14)

Trachypachus luteipes Motschulsky, 1844: 271

Bembidion colchicum Chaudoir, 1850: 175

Bembidion (Chlorodium) luteipes (Motschulsky, 1844)

Bembidion (Chlorodium) splendidum elbursicum Netolitzky, 1939 **n. stat.** (figs. 2, 15)

Bembidion (Chlorodium) elbursicum Netolitzky, 1939: 29

Bembidion (Chlorodium) splendidum pincum De Monte, 1957 (figs. 8, 12, 13)

Bembidium splendidum Sturm, 1825: 145

Bembidion (Chlorodium) splendidum pincum De Monte, 1957: 7

Bembidion (Neja) anatolicum Jedlička, 1968: 286 **n. syn.**

Bembidion (Neja) torosum Marggi & Huber, 1999: 284 **n. syn.**

TAXONOMY

Bembidion (Chlorodium) luridicorne luridicorne Solsky, 1874 (fig. 4) and
Bembidion (Chlorodium) luridicorne lamprinum Reitter, 1895 (figs. 5, 6, 10)

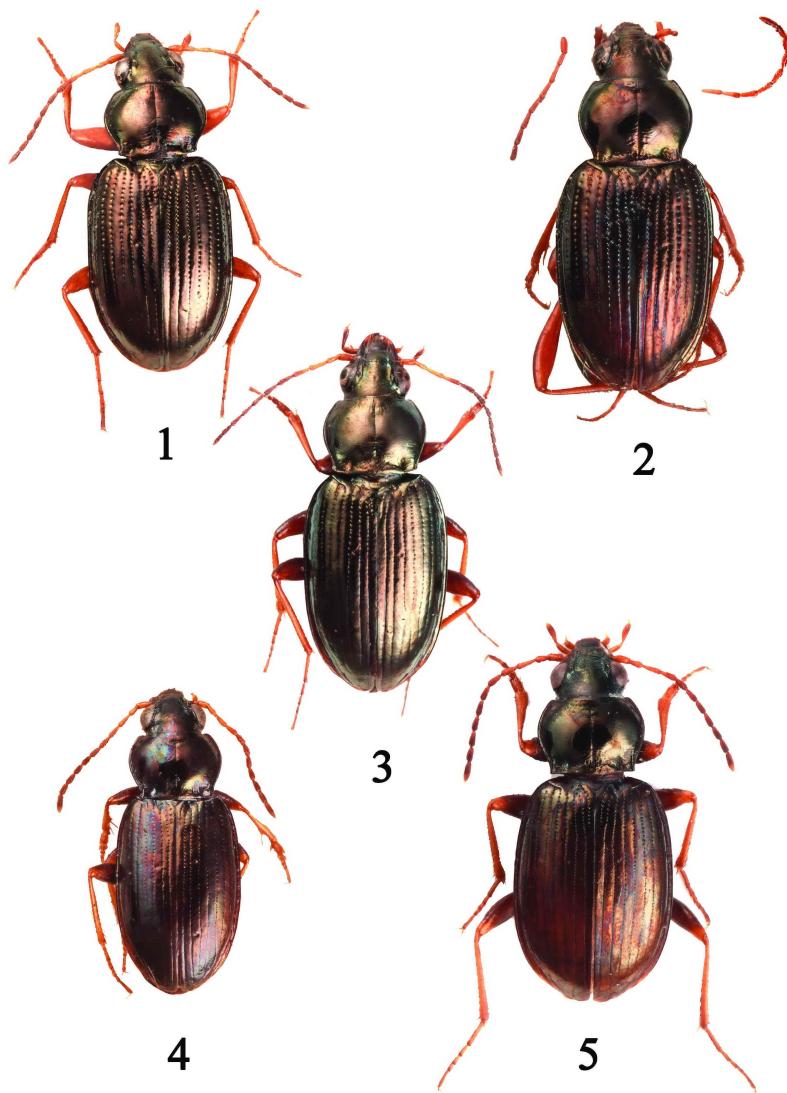
Historical notes. SOLSKY (1874) describes, in latin and cyrillic, *Bembidium luridicorne* on specimens collected at Samarkand; he does not mention on how many specimens it has been done the description. Later four specimens present in the coll. Solsky were mentioned (NETOLITZKY, 1934). The original description is clear and complete; among the characters are reported “Elytres ovales, subparallèles au milieu...”, from the French translation of the description (MARSEUL, 1880), character that revealed to be fundamental for this study.

REITTER (1895) describes *Bembidion lamprinum* on specimens collected at Akbes, in Syria; the description does not say on how many specimens it has been made; it is very short, it reports a few diagnostic characters, e.g. the colour of appendages and the difference of the elytral striae, described as more sharp, but unfortunately he compares the species with *Bembidion (Metallina) lampros* Herbst, 1784, even though affirming that according to the habitus the species should belong to the subgenus *Chlorodium*; obviously the comparison between species belonging to different subgenera makes confusion. NETOLITZKY (1914) reports that *lamprinum* is very near to *luridicorne* Solsky, 1874 after the examination of the type specimen. MÜLLER (1918) describes in the keys the characters of *luridicorne* (except for the elytral one mentioned in the original description) and in a note mentions that *lamprinum* is barely specifically distinct from *luridicorne*, and reports that the appendages are more darkened; the note anyway shows perplexity.

NETOLITZKY (1921), in his “Catalogus” lists within the subgenus *Chlorodium* for the first time *lamprinum* as subspecies of *luridicorne*.

SCHATZMAYR (1936) states the synonymy between var. *lamprinum* and *luridicorne* and reports that in *luridicorne* the colour of the appendages is variable also in the specimens of the same locality.

NETOLITZKY (1942) reports the position of Schatzmayr but he does not validate his decision: he still remains doubtful in considering both taxa as geographic races or synonyms; the elytral character mentioned in the original description is not mentioned.



Figs. 1-5. Habitus of: 1. *B. (C.) splendidum luteipes* Motschulsky, Transcaucasia, Georgia, Mzcheta prov. Tblisi, 4.40 mm (cPN); 2. *B. (C.) splendidum elbursicum* Net., lectotype, 5 mm (NHW); 3. *B. (C.) splendidum splendidum* Sturm, Wien, 4.80 mm (cPN); 4. *Bembidion (Chlorodium) luridicorne luridicorne* Solsky, Turkestan [original label data], 3.90 mm (NMPC); 5. *B. (C.) luridicorne lamprinum* Rtt., Giordania, CN Amman, Al Amiriyya, 4.80 mm (cKR). Photos Luca Toledano.

MANDL (1963) reports the presence in Iran for *luridicorne luridicorne* in “Westl. Sabzawaran” and *luridicorne lamprinum* in “Südöstl. Sabzawaran, südl. Bam”; Sabzawaran is a region of the Kerman Province.

Later almost all authors don't respect the synonymy stated by SCHATZMAYR (1936), and rank *lamprinum* as subspecies of *luridicorne*, among others: LORENZ (2005) and MARGGI et al. (2017); the latter mention the nominotypical form for AB, GG, IN, IQ, KI, KZ, TD, TM, UZ, and the subspecies for IN, IQ, IS, JO, SY.

Material examined and observations. From the mentioned collection we studied 22 exx of *luridicorne luridicorne* from North-IN (Mazandaran pr., Khorasan pr.), KZ (Kujuk, Kara Tau), TD (Kuliab, Fajsabad, Dušambe), TM (Kepela, Kizyl Arvat, Svincovity Rudnik), UZ (Babatag, Bukara), including a ♀, topotypical, with two labels: “Samarkand / Reitter [printed] // *Bembidium / luridicorne* Solsky [handwritten] / Coll. Reitter [printed]” (HNHM); more than 170 exx of *luridicorne lamprinum* from South-IN (Bander Abbas, Minab, Isine, Toubat, Kerman pr.), IQ (Bagdad, Mesopotamia), IS (Ofakim, Dimona, Zor Deir Shaman, Nahal Quidrom, Elifaz, Gerofit, Nahal Gumezan, Seda Boquer), JO (Wadi araba, Al Amiriyya, Jericho), SY (Al Asakah, Palmyra), OM (Musandam pr.), SA (Al Ghat, Shoalb Horimela) (CTVR, HNHM, KR, MHB, NHMB, NMPC, PN, SMNH).

After the examination of the variability of the colour of appendages and the depth of the elytral striae, both between the two taxa, both in material collected in the same locality, we noticed that the character mentioned in the original description “Elytres ovales, subparallèles au milieu...” (SOLSKY, 1874; MARSEUL, 1880 see above), perhaps formerly ignored, actually is clear and evident in nominotypical *luridicorne* (fig. 4), while in *lamprinum* the elytral sides are rounded also in the median third (fig. 5). Furthermore, the length is of 3.90 – 4.70 mm in *luridicorne luridicorne* and 4.30 – 5.10 mm in *luridicorne lamprinum*.

We ascertained that the male genitalia of both taxa are identical and that the elytral microsculpture may be isodiametric, almost isodiametric or irregular.

We also report that “Mandl's mention (MANDL, 1963) of nominotypical *luridicorne* from Sabzawaran actually refers to the subspecies *lamprinum*, since we were allowed to study one specimen of NMPC from the same localities of the “Österreichischen Iran-Expedition 1949/50”.

Conclusions. We think that the characters regarding elytral width and shape are sufficient to keep both taxa as subspecifically distinct and confirm the validity of the subspecies *lamprinum*.

Bembidion (Chlorodium) quailaicum Kirschenhofer, 1984 = *Bembidion (Chlorodium) luridicorne luridicorne* Solsky, 1874 n. syn.

Historical notes. KIRSCHENHOFER (1984) describes *Bembidion (Chlorodium) quailaicum* on two specimens (♂♀) from Quaila (Afghanistan). The description

is clear and detailed and the differential diagnosis is made with *Bembidion* (*C.*) *splendidum* Sturm, 1825.

MÜLLER-MOTZFELD (1988) reports the drawing of the aedeagus of a specimen of *luridicorne* from Quaila (Afghanistan); the image is used in order to explain some characters present in some Himalayan species and is not a study on the *Chlorodium*, anyway mentions the presence of *luridicorne* in Afghanistan and exactly at Quaila; mention that, due to the particular context, was obviously ignored by the following authors (MARGGI et al., 2003; MARGGI et al., 2017) and therefore *luridicorne luridicorne* is not mentioned for Afghanistan.

Material examined and conclusions. From NHMW we have received the holotype (♂) of *quailaicum*; the specimen bears two labels: “Afgh. Quaila / 2500 m / IV. 1977 / Coletti [handwritten] // *B. (Chlorodium)* / n. sp. / det. Kirschenhofer 1982 / HOLOTYPE [red, handwritten]”. The specimen lacks the aedeagus.

After comparison of the holotype with several specimens of *luridicorne luridicorne* we noticed that the exoskeletal characters match. It is therefore stated the synonymy between *quailaicum* and *luridicorne luridicorne*.

The distribution of *luridicorne luridicorne* is therefore extended to Afghanistan. We added to the specimen the following label: *Bembidion (Chlorodium) luridicorne luridicorne* Solsky – det. Neri & Toledano 2019.

***Bembidion (Chlorodium) wittmeri* (Basilewsky, 1979)=*Bembidion (Chlorodium) luridicorne lamprinum* Reitter, 1895 n. syn.**

Historical notes. BASILEWSKY (1979) describes *Chlorodium wittmeri* on a single female specimen from Wadi Sheib Luna in Saudi Arabia. The description is clear and detailed and ends mentioning that this species is well distinct from the others of the genus for the large size (5 mm) for the pronotum entirely covered by a dense, isodiametric, microsculpture, for the puncturation of the elytral striae and the strong microsculpture of the elytral intervals. In the description are also mentioned three discal pores on the third interval.

Later (e.g. LORENZ, 2005, MARGGI et al., 2017) the species is listed under genus *Bembidion* subgenus *Chlorodium*. MARGGI et al. (2017) mention the species for Saudi Arabia and Oman.

It's important to report that in FELIX (2009), in a study on the Carabidae of the United Arab Emirates, *wittmeri* is not mentioned, but is mentioned in that area *luridicorne lamprinum* Rtt.

Material examined and conclusions. In CTVR and PN we studied six specimens from Saudi Arabia, Oman and United Arab Emirates, all determined as *wittmeri*. We also have a photo of the holotype of *wittmeri* taken in the past at HNMB (L.T.).

At first we ascertained that the length of the holotype is 4.90 mm and that all the diagnostic characters mentioned by the describer actually are present, even though with faint variability, also in *luridicorne lamprinum* Reitter; the discal pore punctures visible on the left elytron are two, as usual, while in the right one they are three. We think that the supernumerary seta could be an individual aberration as it occurs, even though rarely, in the genus *Bembidion*.

Since also *luridicorne lamprinum* can be long between 4.30 and 5.10 mm, we think that the diagnostic characters mentioned by the author are not yet valid. The genitalia of two specimens from the United Arab Emirates are identical to those of *luridicorne lamprinum*. Is therefore stated the synonymy reported between these two species.

We added to the specimen the following label: *Bembidion (Chlorodium) luridicorne lamprinum* Reitter – Neri & Toledano det. 2019.

Distribution. After the synonymy stated above, the distribution of *luridicorne lamprinum* Reitter is the following: IN, IQ, IS, JO, SY (MARGGI et al., 2017); OM, SA (sub *wittmeri* - MARGGI et al., 2017); AE (FELIX, 2009).

Bembidion (Chlorodium) splendidum splendidum Sturm, 1825 (figs. 3, 7, 11) and ***Bembidion (Chlorodium) splendidum pincum*** De Monte, 1957 (figs. 8, 12, 13)

Historical notes. STURM (1825) describes *Bembidium splendidum* from Vienna. MÜLLER (1918) reports for *Bembidion (Chlorodium) splendidum* the following distribution: Central and Eastern Europe, Balcan Peninsula and Asia Minor. NETOLITZKY (1942), while confirming the same distribution, reports that in its south-eastern portion (Balkans, Asia Minor) are present specimens different for the deeper striae, similar to *luteipes* Motschulsky, 1844.

DE MONTE (1957) describes *Bembidion (Chlorodium) splendidum pincum* from Serbia: Pozezeno; he reports the diagnostic characters in respect to the nominotypical form, *luteipes* (Caucasus) and *elbursicum* Netolitzky, 1939 (North Iran: Elburs), species that actually De Monte ranks as subspecies of *splendidum* waiting for the examination of their genitalia; it is also hypothesized that *pincum* could replace the nominotypical form in the whole Balkan area, but it is not defined a precise distribution either for the nominotypical form, or for *pincum*, JEDLIČKA (1968) describes *Bembidion (Neja) anatolicum* on two ♀♀ from Selifke (Central-Southern Turkey); the name will be replaced with *torosum* by MARGGI & HUBER (1999) for homonymy with *Bembidion (Pseudolimnaeum) lederi anatolicum* Korge, 1964.

Later both taxa, *splendidum* and *pincum* are mentioned by MARGGI et al. (2017) with the following distribution: Western and Eastern Europe, Balkan Peninsula, Caucasus, TR, SY and EG for *splendidum*; AL, BU e SB for

splendidum pincum. PAILL et al. (2018), after the description of the habitat in Albania where they found the species, retain that taxonomy and distribution need further studies.

Material examined and conclusions. We were allowed to study abundant material from almost the whole distribution area of *splendidum* s.l. (350 exx.); the material of the Caucasian area (GG) examined belongs to *luteipes*.

From NMPC we received the paratype ♀ of *anatolicum*, bearing three labels: “Selifke, Anat.m / 7.-9.6.63 / leg. F. Schubert [printed] // Paratypus [red, printed] // *Bembidion* / (Neja) / *anatolicum* sp.n. [red, handwritten] / det. Ing. Jedlička [red, printed]”.

It was impossible to find the holotype ♀ of *Bembidion anatolicum* Jedlička in the collection Schubert (NHMW) (H. Schillhammer, personal communication).

As first we report that the aedeagic character mentioned in the original description of *pincum* is not constant because the extreme of the apex may be more or less elongate both in *splendidum* nominotypical and in *pincum*. Also the difference in the length of the third and fourth antennomeres is barely visible. On the contrary, the difference in the pronotal microsculpture between *splendidum* nominotypical and its subspecies is clear and evident: compact isodiametric or almost isodiametric microsculpture, therefore the pronotum is more matt, in *splendidum splendidum* (fig. 7) and less impressed, short and transverse microsculpture, less evident mainly on disk, therefore the pronotum is more glossy, in the subspecies (fig. 8). After the examination of the material, together with the confirmation of the validity of the subspecies *pincum* and of De Monte's suspect (DE MONTE, 1957) regarding its presence in the Balkan area, we propose the following distribution: for *splendidum splendidum* AR, AB, GG, ST (KRYZHANOVSKIJ et al., 1995); AU, BU, CR, CZ, GE, HU, IT, MD, PL, RO, SK, SL, UK; the presence in the Balkan area should be checked again; for *splendidum pincum* AL, BU, BH, CR, GR, MC, SB, YU, TR. The mention of *splendidum splendidum* for Syria (PIOCHARD DE LA BRULERIE, 1875) most probably refers to *luridicorne lamprinum* Rtt.; that for Egypt is probably a mistake, therefore we delete both Syria and Egypt from its distribution.

Regarding the typical series of *anatolicum*, the specimens actually belong to *splendidum pincum*, therefore we propose the following synonymy (with junior synonym listed first): *Bembidion (Neja) anatolicum* Jedlička, 1968 **n. syn.** of *Bembidion (Chlorodium) splendidum pincum* De Monte, 1957; consequently, *Bembidion (Neja) torosum* Marggi & Huber, 1999 **n. syn.** of *Bembidion (Chlorodium) splendidum pincum* De Monte, 1957.

We added to the paratype the following label: *Bembidion (Chlorodium) splendidum pincum* De Monte, 1957 – det. Neri & Toledano 2019.

Bembidion (Chlorodium) splendidum luteipes (Motschulsky, 1844) **n. stat.** (figs. 1, 14) and ***Bembidion (Chlorodium) splendidum elbursicum*** Netolitzky, 1939 **n. stat.** (figs. 2, 15)

Historical notes. MOTSCHULSKY (1844) describes *Trachypachus luteipes* from banks of Kour, near Tiflis (Tbilisi, Georgia). CHAUDOIR (1850) describes *Bembidium colchicum* from near Koutais (Georgia); the species was later synonymized with *Bembidion luteipes* by NETOLITZKY (1914), synonymy later confirmed by Netolitzky himself in NETOLITZKY (1935) where he officially states that the valid name is *luteipes*.

NETOLITZKY (1939) describes *Bembidion (Chlorodium) elbursicum* from Elburs Mts. in North Persia; the description, made in the keys of the subgenus through the differences with the other species of the subgenus, is not too detailed and are not mentioned the number of the examined specimens and the type designation.

DE MONTE (1957), during the description of *Bembidion (Chlorodium) splendidum pincum*, considering both *luteipes* and *elbursicum* as subspecies of *splendidum*, points out the differential characters but reports that he studied a single female (cotype) of *elbursicum*, immature and damaged; he does not take any position regarding the specific value of both taxa, but, according to the examined specimens (without examination of the genitalia) he concludes that they all belong to the same species.

Later there is a record of *luteipes* for Northeastern Turkey (KORGE, 1964); both taxa are present in catalogues as good species or as subspecies of *splendidum*, until MARGGI et al. (2017) reports the following status and distribution: AB, AR, GG, ST, IN, IQ, IS, TR for *Bembidion (Chlorodium) luteipes*; IN, IQ for *Bembidion (Chlorodium) elbursicum*.

Material examined. We examined several specimens of *luteipes* from Georgia: Borzomi, Tbilisi pr., Rustavi, Abkhasia (KR, MHB, PN and CTVR).

From NHMW we receive the following six specimens that could be the whole type series of *elbursicum*; one ♀ bearing seven labels: “Elburs – Gebirge / Iran, Nord Persien / B. v. Bodemeyer [printed] // [a small drawing of the tooth of mentum] Kinnzahn [handwritten] // n. sp. / dt. Netolitzky / non! *colchicum* [handwritten] // coll. / Netolitzky [printed] // *elbursicum* / Type Netolit [habdwritten] // TYPUS [red, printed] // Coll. / Netolitzky [printed]”; the specimen, immature, lacks the fore right leg, the mid left leg and some antennomeres glued on the label of the specimen. One ♀ bearing five labels: “Elburs – Gebirge / Iran, Nord Persien / B. v. Bodemeyer [printed] // [a small drawing of the tooth of mentum] Kinnzahn [handwritten] // coll. / Netolitzky [printed] // *elbursicum* / dt. Netolit / ca.... [incomprehensibile] [handwritten] // CO / TYPUS [red, printed]”; the specimen, immature, is in very bad conditions, lacking the head, the fore right leg and a part of the apex of left elytron. One ♀ bearing five labels: “Elburs – Gebirge

/ Iran, Nord Persien / B. v. Bodemeyer [printed] // coll. / Paul Meyer / 1919 // coll. / Netolitzky // *elbursicum* / det. Netolitzky / Cotypus [handwritten, partially underlined in red] // CO / TYPUS [red, printed]”; the specimen, immature, is in very bad conditions, lacking the hind left leg, five antennomeres of left antenna, the pronotum broken and with a hole and the elytra in part missing and broken in the apical portion. One ♀ bearing five labels: “Elburs – Gebirge / Iran, Nord Persien / B. v. Bodemeyer [printed] // [a small drawing of the tooth of mentum] Kinnzahn [handwritten] // coll. / Netolitzky // *elbursicum* / det. Netolitzky / Cotypus // CO / TYPUS [red, printed]”; the specimen, immature, is in very bad conditions, with elytra missing the extreme of apex and highly contused; head and pronotum are divided from the rest of body and glued, in reversed position, on the label. One ♂ slightly immature bearing six labels: “Elburs – Gebirge / Iran, Nord Persien / B. v. Bodemeyer [printed] // coll. Paul / Meyer [printed] // *elbursicum* / det. Netolitzky / Mikroskulpta! [handwritten, underlined in red] // Coll. / P. Meyer [printed] // Acqu – Nr. / 1951 – 23 [printed] // CO / TYPUS [red, printed]”. One ♂ bearing five labels: ““Elburs – Gebirge / Iran, Nord Persien / B. v. Bodemeyer [printed] // coll. Paul / Meyer [printed] // *elbursicum* / det. Netolitzky [handwritten] // Acqu – Nr. / 1951 – 23 [printed] // CO / TYPUS [red, printed]”; the antennae are divided and glued on the label near the head (fig. 2); the aedeagus, in euparal, is preserved on the same pin and has the basal bulb broken (fig. 15).

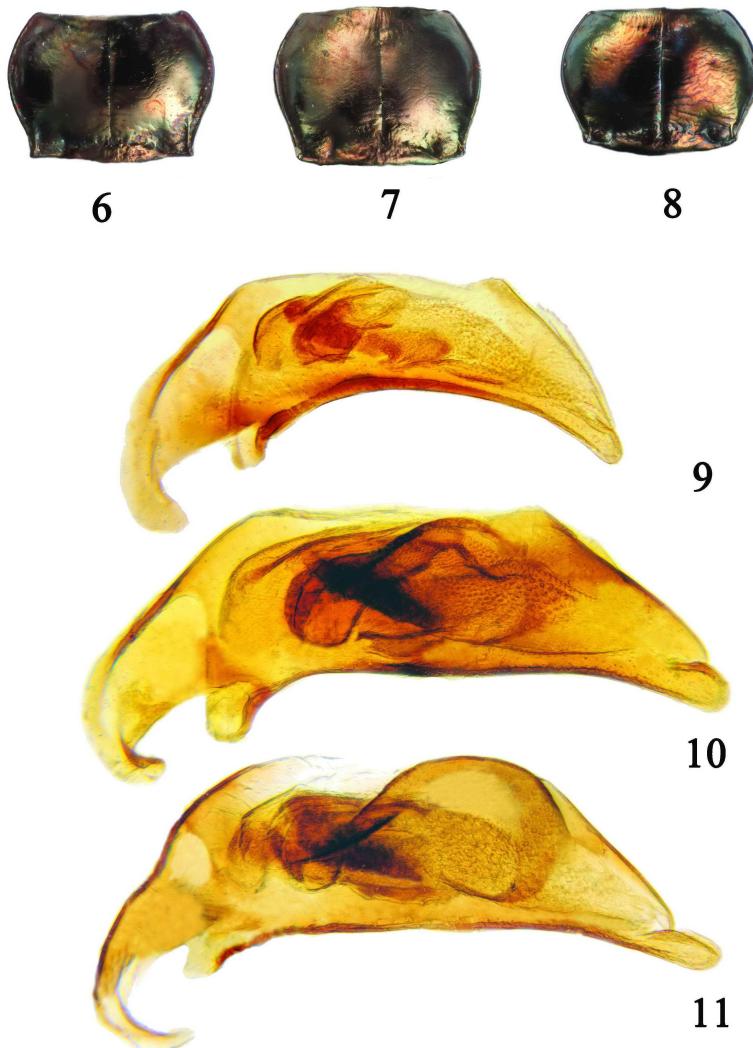
The red printed labels TYPUS and CO/TYPUS were added to the specimens later. Not having been clearly designated, in the original description, the holotype of the species, we prefer to designate here as lectotypus this last ♂ specimen completely mature and well preserved, and not the specimen ♀ formerly labelled as “Type” by Netolitzky himself (the first one of the specimens listed above).

We added to this last specimen the following label: *Bembidion (Chlorodium) elbursicum* Netolitzky, 1939 - LECTOTYPUS - P. Neri & L. Toledano des. 2019 and the following label to the remaining six specimens: *Bembidion (Chlorodium) elbursicum* Netolitzky, 1939 – PARALECTOTYPUS - P. Neri & L. Toledano des. 2019.

Observations and conclusions. We compared the type series of *elbursicum* with several specimens of *luteipes* collected in Georgia and we noticed a clear difference in the elytral shape: in *luteipes* they are more thickset and wide (fig. 1), with humeri and apex slightly rounded; in *elbursicum* they are more elongate (fig. 2), with apex more stout. More complex the differentiation from *pincum* which differs from both other subspecies for the femora at least in part darkened and the pronotal hind angles evidently obtuse, at least for the European specimens.

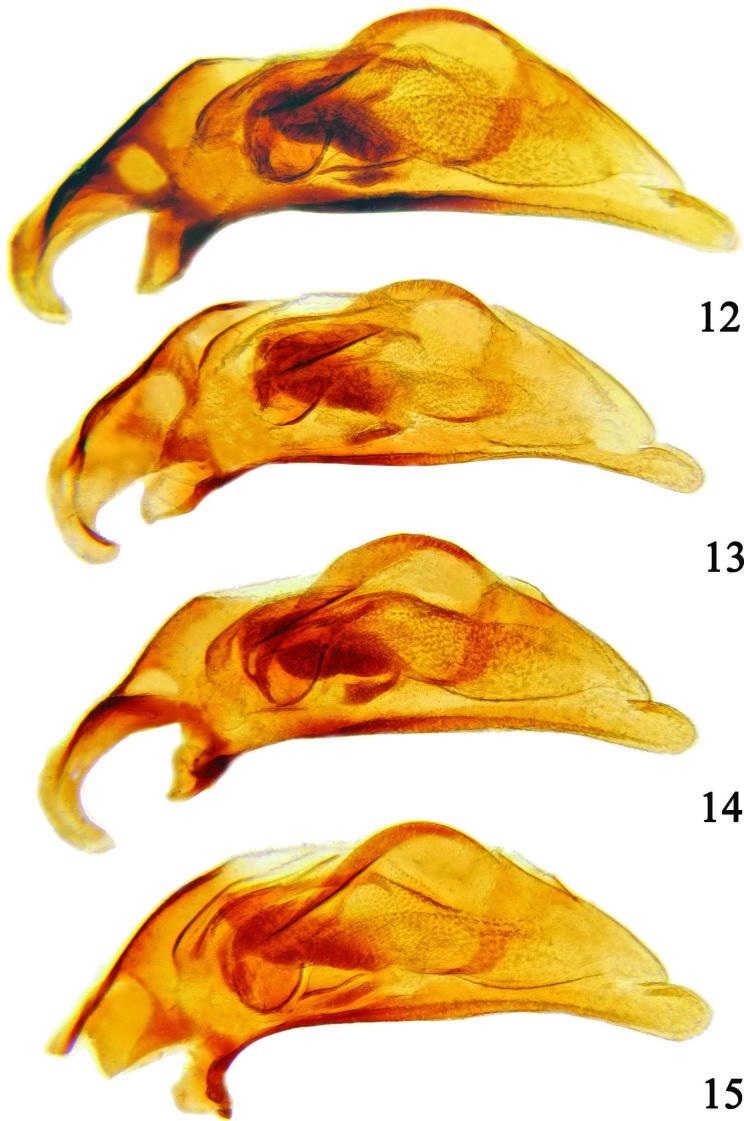
Since also other characters (elytral puncturation and striation, aedeagal characters) are similar, we think, as already hypothesized by DE MONTE (1957), that both *luteipes* and *elbursicum* are subspecies of *splendidum*.

The distribution of *Bembidion (Chlorodium) splendidum elbursicum* is IN, IQ



Figs. 6-8. Pronota of: 6. *Bembidion (Chlorodium) luridicorne lamprinum* Rtt., Giordania, CN Amman, Al Amiriyya; 7. *B. (C.) splendidum splendidum* Sturm, Wien; 8. *B. (C.) splendidum pincum* De Monte, Serbia, Nis Katun (cPN). Photos Luca Toledano.

Figs. 9-11. Median lobe of aedeagus of: 9. *B. (C.) pygmaeum* F., Romania, Muntele, Posaga Aries, 0.73 mm (cPN); 10. *B. (C.) luridicorne lamprinum* Rtt., Israel, North Negev, Ofakim, 0.92 mm (cPN); 11. *B. (C.) splendidum splendidum* Sturm, Wien, 0.92 mm (cPN). Photos Gabriele Fiumi.



Figs. 12-15. Median lobe of aedeagus of: 12. *Bembidion (Chlorodium) splendidum pincum* De Monte, Serbia, Nis Katun, 1.04 mm (cPN); 13. *B. (C.) splendidum pincum* De Monte, Turkey, NW of Silifke, Goksu canyon, 0.91 mm (cPN); 14. *B. (C.) splendidum luteipes* Motschulsky, Georgia, Transcaucaso, Tbilisi, 0.95 mm (cPN); 15. *B. (C.) splendidum elbursicum* Net., lectotypus, 0.94 mm (NHMW). Photos Gabriele Fiumi.

(MARGGI et al., 2017) although IQ must be checked again. In fact the locality reported by Marggi “Wadi al Azimi, Iraq, Western desert” (personal communication to L.T.) is in an environment particularly adverse for an alpine species.

The distribution of *splendidum luteipes* is AB, AR, GG, ST, IN, IQ, IS, TR, although IN, IQ, IS, must be checked again; regarding IN, the locality mentioned by Marggi is “Marzanabad, Chalus-River” (personal communication to L.T.). The examined specimen, we were allowed to check, is a *luridicorne luridicorne*; anyway we think that *luteipes* may be present in the north west of Iran. Instead, for IS and IQ we think to a mistake of determination, but we weren’t able to check the specimens that led to the mention.

All the specimens seen until now from Turkey revealed to belong to *splendidum pincum*, and so *splendidum luteipes* may be present in the extreme North East of Turkey too.

Keys of *Bembidion* subg. *Chlorodium* Motschulsky, 1864 for the species with pronotum at least in part microsculptured

We were able to study specimens from the localities indicated by “!”. List of the species: *pygmaeum* Fabricius, *splendidum splendidum* Sturm, *splendidum pincum* De Monte, *splendidum luteipes* Motschulsky, *splendidum elbursicum* Netolitzky, *luridicorne luridicorne* Solsky, *luridicorne lamprinum* Reitter, *loricatum* Andrewes.

- 1 antennae, femora and tarsi completely blackened; completely microsculptured with almost isodiametric sculpticells; elytra uniformly metallic with slightly variable colour (cupreous, cyaneous, etc.) or with a preapical round spot (ab. *bilunulatum* Bielz), elytral striae and puncturation barely visible, stria 7 almost vanishing; 3.5 – 4.2 mm; aedeagus (fig. 9); Europe up to Ukraine, IS (MARGGI et al., 2017)
..... *pygmaeum* Fabricius, 1792

The mention for IS refers to a specimen ♂ (SMNH), checked by us, so labelled: Benjamina, Palestine, 15.XI.1940, leg. Bytinski-Salz; we suppose a mislabelling. The species is anyway mentioned from Israel, after several captures, by CHIKATUNOV et al. (1999) and by FINKEL et al. (2002); the presence of the species in Israel in our opinion is anyway doubtful.

- at least a few basal antennomeres light 2
- 2 pronotum with sides moderately convex forwards, towards the anterior angles (fig. 6), hind pronotal angles right with sometimes the apex slightly acute; femora darkened with light apex 3
- pronotum very convex forward, towards the anterior angles, and therefore anterior angles more bent ventrally (fig. 7); hind pronotal angles obtuse (*splendidum splendidum* Sturm and *splendidum pincum* De Monte) or only slightly obtuse to almost right (*splendidum luteipes* Mtsch. and *splendidum*

- elbursicum* Net.), in this case femora light 5
- 3 whole upper surface with polygonal microsculpture barely transverse and therefore matt; third elytral interval with both pore punctures in foveae extending on the whole width; upper surface dark bronze, first two antennomeres and base of antennomere 3 and 4 light, tibiae and tarsi light, penultimate palpomere slightly darkened; femora darkened with light apex; 4.50 – 5.00 mm; India: Huttar Pradesh (MARGGI et al., 2017)
..... *loricatum* Andrewes, 192
- Characters taken from the original description and from the photo of the holotype (♀).
- pronotum with microsculpture less impressed, transverse and short, less evident mainly on disk, therefore glossy; third elytral interval with both pore punctures in normal foveae; antennae slightly darkened from antennomere 4 or 5 4
- 4 species on average smaller, 3.90 – 4.70 mm (fig. 4); elytra oval with median third only slightly rounded or subparallel; elytra, towards intervals 7 and 8 more convex; elytral colour black, bronze black; femora almost completely darkened; AB, GG, IN!, IQ, KI, KZ!, TD!, TM!, UZ! (MARGGI et al., 2017)
..... *luridicorne luridicorne* Solsky, 1874
- species on average larger, 4.30 – 5.10 mm (fig. 5); elytra oval with median third regularly rounded; elytra towards interval 7 and 8 less convex, therefore the elytral width is more evident; elytral colour black, bronze black or shiny bronze; femora almost completely darkened; aedeagus (fig. 10); IN!, IQ!, IS!, JO!, SY!, OM!, SA! (MARGGI et al., 2017); AE (FELIX, 2009)
..... *luridicorne lamprinum* Reitter, 1895
- 5 pronotum with isodiametric or almost isodiametric microsculpture sharp and evident, therefore often matt (fig. 7); elytra with isodiametric, almost isodiametric or irregular microsculpture, striae and puncturation less deep; penultimate palpomere slightly darkened, first three antennomeres and a part of antennomere 4 light, rest of antennae darkened; femora slightly darkened; 4.20 – 5.00 mm (fig. 3); aedeagus (fig. 11); AB, AR, GG, ST (KRYZHANOVSKIJ, 1995); AU!, BU!, CR!, CZ, GE, HU, IT!, MD, PL, RO!, SK!, SL, UK! *splendidum splendidum* Sturm, 1825
- The mentions for AB, AR, GG, ST (KRYZHANOVSKIJ et al., 1995), here anyway reported, should be checked again.
- pronotum with microsculpture less impressed, transverse and short, less evident, therefore more glossy (fig. 8); striae and elytral puncturation deeper 6

- 6 femora at least in part darkened; pronotum with hind angles small and evidently obtuse; elytra with polygonal microsculpture short and transverse, almost isodiametric or irregular (♀♀) or short and/or transverse (♂♂); colour of appendages as in the type form, but penultimate palpomere lighter or slightly darkened at apex; 4.20 – 5.10 mm; aedeagus (figs. 12, 13); AL, BH!, BU!, CR, GR!, MC!, SB!, YU, TR!.....
..... ***splendidum pincum*** De Monte, 1957
The Turkish populations may show hind pronotal angles only slightly obtuse.
- femora reddish yellow; pronotum with hind angles almost right or only slightly obtuse 7
- 7 elytra (fig. 1) shorter and wider, with humeri and apex slightly rounded; elytral microsculpture almost isodiametric or irregular (♀♀), transverse and short (♂♂); 4.20 – 4.80 mm; aedeagus (fig. 14); AB, AR, GG!, ST!, IN, IQ?, IS?, TR
..... ***splendidum luteipes*** (Motschulsky, 1844)
The mentions for IQ, IS (MARGGI et al., 2017) anyway here reported, should be checked again.
- elytra (fig. 2) more elongate, with subparallel sides and apex only barely rounded; elytral microsculpture short and transverse or irregular (♀♀), transverse (♂♂); 4.70 – 5.00 mm (type series); aedeagus (fig. 15); IN!, IQ (MARGGI et al., 2017) ***splendidum elbursicum*** Netolitzky, 1939
The mentions for IQ (MARGGI et al., 2017) anyway here reported, should be checked again.
In HNHM is present a ♂ of *elbursicum* with the following two labels: Caucasus / Reitter [printed] // *Bembidium / colchicum* Chd. [handwritten] / Coll. Reitter [printed].

Chiavi del sottogenere *Chlorodium* Motschulsky, 1864 per le specie con pronoto almeno parzialmente reticolato

Delle nazioni contrassegnate con ! sono stati studiati esemplari. Elenco specie: *pygmaeum* Fabricius, *splendidum splendidum* Sturm, *splendidum pincum* De Monte, *splendidum luteipes* Motschulsky, *splendidum elbursicum* Netolitzky, *luridicorne luridicorne* Solsky, *luridicorne lamprinum* Reitter, *loricatum* Andrewes.

- 1 antenne, femori e tarsi interamente anneriti; completamente reticolato a maglie quasi isodiametrichi; elitre uniformemente metalliche a colorazione leggermente variabile (cuprea, cyanea, ecc.) o con una macchia preapicale rotonda (ab. *bilunulatum* Bielz), strie e punteggiatura appena evidenti, settima stria quasi sparita; 3.5 – 4.2 mm; edeago (fig. 9); Europa fino all'Ucraina, IS (MARGGI et al., 2017) ***pygmaeum*** Fabricius, 1792

La citazione per IS si riferisce ad un esemplare ♂ (SMNH), da noi controllato, così etichettato: Benjamina, Palestine, 15,XI.1940, leg. Bytinski-Salz; supponiamo un errore di etichettatura. La specie è comunque citata di Israele, in seguito a numerose catture, da CHIKATUNOV et al. (1999) e da FINKEL et al. (2002); noi comunque abbiamo seri dubbi circa la presenza della specie in Israele.

- almeno alcuni articoli basali delle antenne chiari 2
- 2 pronoto in avanti, verso gli angoli anteriori, a lati moderatamente convessi (fig. 6), angoli posteriori retti con, a volte, l'apice leggermente acuto; femori oscurati con apice chiaro 3
- pronoto in avanti, verso gli angoli, molto convesso e quindi gli angoli anteriori più piegati ventralmente (fig. 7); angoli posteriori del pronoto ottusi (*splendidum splendidum* Sturm e *splendidum pincum* De Monte) o solo leggermente ottusi o quasi retti (*splendidum luteipes* Mtsch. e *splendidum elbursicum* Net.), nel qual caso femori chiari 5
- 3 l'intera parte superiore con reticolo poligonale microscopico appena trasverso e quindi opaca; terza interstria con le due setole inserite in fossette occupanti l'intera larghezza; superiormente bronzo scuro, primi due articoli delle antenne e base del terzo e quarto chiari, tibie e tarsi chiari, palpi con penultimo articolo leggermente oscurato; femori oscurati con apice chiaro; 4.50 – 5.00 mm; India: Huttar Pradesh (MARGGI et al., 2017)
..... ***loricatum*** Andrewes, 1922
Caratteri tratti dalla descrizione e dalla foto dell'olotipo (♀).
- pronoto con reticolazione meno impressa, trasversa e corta, meno evidente soprattutto sul disco, per cui lucido; terza interstria con le due setole inserite in normali fossette; antenne leggermente insurrite dal quarto o quinto articolo 4
- 4 specie mediamente più piccola, 3.90 – 4.70 mm (fig. 4); elitre ovali con terzo mediano solo leggermente tondeggiante o subparallelo; elitre, verso la settima e ottava interstria più convesse; colorazione elitre nero, nero bronzeo; femori quasi totalmente insuriti; AB, GG, IN!, IQ, KI, KZ!, TD!, TM!, UZ! (MARGGI et al., 2017)..... ***luridicorne luridicorne*** Solsky, 1874
- specie mediamente più grande, 4.30 – 5.10 mm (fig. 5); elitre ovali con terzo mediano regolarmente arrotondato; elitre verso la settima e ottava interstria meno convesse per cui la larghezza delle elitre appare più accentuata; colorazione elitre nero, nero bronzeo o bronzeo lucente; femori quasi totalmente insuriti; edeago (fig. 10); IN!, IQ!, IS!, JO!, SY!, OM!, SA! (MARGGI et al., 2017); AE (FELIX, 2009)
..... ***luridicorne lamprinum*** Reitter, 1895

- 5 pronoto con un reticolo isodiametrico o quasi isodiametrico chiaro ed evidente, per cui spesso più opaco (fig. 7); elitre a reticolazione isodiametrica, quasi isodiametrica o irregolare, strie e punteggiatura meno profonda; penultimo articolo dei palpi leggermente inscurito, antenne con i primi tre articoli e parte del quarto chiari, i rimanenti inscuriti; femori leggermente inscuriti; 4.20 – 5.00 mm (fig. 3); edeago (fig. 11); AB, AR, GG, ST (KRYZHANOVSKIJ, 1995); AU!, BU!, CR!, CZ, GE, HU, IT!, MD, PL, RO!, SK!, SL, UK!
..... ***splendidum splendidum*** Sturm, 1825
Le citazioni per AB, AR, GG, ST (KRYZHANOVSKIJ et al., 1995), comunque qui riportate, dovrebbero essere ricontrolate.
- pronoto con reticolazione meno impressa, trasversa e corta, meno evidente, per cui più lucido (fig. 8); strie e punteggiatura elitrale più profonda 6
- 6 femori almeno parzialmente inscuriti; pronoto con angoli posteriori piccoli e molto ottusi; elitre con reticolazione poligonale corta e trasversa, quasi isodiametrica o irregolare (♀♀) o corta e/o trasversa (♂♂); colorazione appendici come in forma tipica ma penultimo articolo dei palpi chiaro o leggermente inscurito all'apice; 4.20 – 5.10 mm; edeago (figg. 12, 13); AL, BH!, BU!, CR, GR!, MC!, SB!, YU, TR!
..... ***splendidum pincum*** De Monte, 1957
Presso le popolazioni turche gli angoli posteriori del pronoto possono essere solo leggermente ottusi.
- femori giallo rossicci; pronoto con angoli posteriori quasi retti o solo leggermente ottusi 7
- 7 elitre (fig. 1) più corte e ampie, con omeri e apice leggermente tondeggianti; elitre con reticolazione quasi isodiametrica o irregolare (♀♀), trasversa e corta o irregolare (♂♂); 4.20 – 4.80 mm; edeago (fig. 14); AB, AR, GG!, ST!, IN, IQ?, IS?, TR ***splendidum luteipes*** (Motschulsky, 1844)
Le citazioni per IQ, IS, comunque qui riportate, dovrebbero essere ricontrolate.
- elitre (fig. 2) più allungate, con lati subparalleli ed apice appena più attenuato; reticolazione elitrale corta e trasversa o irregolare (♀♀), trasversa (♂♂); 4.70 – 5.00 mm (serie tipica); edeago (fig. 15); IN!, IQ (MARGGI et al., 2017)
..... ***splendidum elbursicum*** Netolitzky, 1939
La citazione per IQ, comunque qui riportata, dovrebbe essere ricontrolata.
In HNHM è presente un ♂ di *elbursicum* con le seguenti due etichette: Caucasus / Reitter [stampato] // *Bembidium / colchicum* Chd. [a mano] / Coll. Reitter [stampato].

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