6. Comments on taxonomy, nomenclature, and distribution

This chapter contains references to figures of different types: links like "Fig. 1" refer to the figures in the present chapter, links like "*Anopachys* figure 16: 1" refer to the pictures in the chapter "5. Review of the subgenera... ".

1. The original diagnosis of the subgenus *Allohypericia* includes the following characters (Bechyné, 1950a): female 1st tarsomere with glabrous longitudinal medial furrow below (except *Ch. pubitarsis*), elytral puncturation as in the subgenus *Hypericia* [in other words, punctures are arranged in rows, my comment], but slightly less regular, pronotal lateral callus distinctly convex along entire length, area: Eastern Asia. *Chrysomela lobicollis* Fairmaire was originally designated as a type species (Bechyné, 1950a). Later, the taxon *lobicollis* was considered to be a subspecies (Mohr, 1966a) of the species *Ch. aeruginosa*, or junior synonym (Gressitt, Kimoto, 1963) of *Ch. aeruginosa*, or junior synonym (Bieńkowski, 2001, 2007a) of *Ch. aeruginosa poricollis*. The subgenus *Allohypericia* was treated as a group of the species close to *Ch. aeruginosa* (Bechyné, 1952a; Gressitt, Kimoto, 1963; Medvedev, 1982; Bourdonné, Doguet, 1991; Medvedev, Dubeshko, 1992; Bieńkowski, 2001, 2007a, 2010, 2011; Lopatin, 2010).

Bourdonné (2010b) examined a type specimen of *Ch. lobicollis*, decided that this taxon is not close to *aeruginosa*, transferred *lobicollis* to the subgenus *Anopachys* as a valid species (however, the morphological evidences for this point of view have not been presented by J.-C. Bourdonné till now). Because of that, Bourdonné (2010b) considered *Allohypericia* as junior synonym of *Anopachys*. However, the characters and area of the subgenus *Allohypericia*, mentioned by the author, Bechyné (1950a), in the original description (cited above) permit me to conclude: 1) Bechyné (1950a) incorrectly and unintentionally identified the type species, *lobicollis*, 2) Bechyné (1950a) considered the subgenus *Allohypericia* to be a group of the species close to *aeruginosa*. A specimen from the collection by J. Bechyné (NHMB, Frey collection), examined by me, confirms this point of view. This specimen is supplied with label: "*Chrysolina lobicollis* Frm. Det. Dr. J. Bechyné 1950". I identify this specimen as *Ch. aeruginosa poricollis*. Therefore, I use ICZN (1999, 70.3) for the stability of the nomenclature and designate *Chrysomela poricollis* as a type species of the subgenus *Allohypericia* and consider this subgeneric name to be valid one.

Taxonomic position of *Chrysomela lobicollis* Fairmaire – see Comment 5.

2. The taxon *violaceocoerulea* was cited by Kippenberg (2010) with the authorship by "Geoffroy (1785)" as unused senior synonym of *Ch. fuliginosa galii*. It is more correctly to consider Fourcroy (1785) as the author of the mentioned publication. But really, *Chrysomela violaceocoerulea* was firstly described by Degeer (1778: p. 106) from France: "in Agro Parisiensi". It is a senior synonym of *fuliginosa galii* (Kippenberg, 2010, after J.-C. Bourdonné, personal communication, type examined), however it has not been used as a valid name after 1899 and is a *nomen oblitum*, but junior synonym *fuliginosa galii* is currently in use (Kippenberg, 2010). However, we do not have enough publications to apply ICZN (1999, 23.9.2). Therefore, it is need to use ICZN (1999, 23.9.3) and refer the question to the Commission on zoological nomenclature.

Besides that, Kippenberg (2010) cited sufficient evidence to recognize the name *fuliginosa* as *nomen protectum* according to ICZN (1999, 23.9.1.2, 23.9.2).

3. Several localities of *Ch. asclepiadis bohemica* in European Russia are mentioned by Bieńkowski (2007a) and Bieńkowski (2009a). Recently this species was found in European Russia: Belgorod reg., Bashkortostan, Tatarstan, Saratov reg., Ulyanovsk reg. (Dedyukhin, 2014 and material examined).

4. *Ch. eurina* is recorded in the following regions of Russia: European Russia: Samara, Moscow reg., Tambov reg., Nizhny Novgorod reg., Penza reg., Vladimir reg.; Siberia: Khakass Republic, Kemerovo reg., Krasnoyarsk Prov., Altai Republic (Orlova-Bienkowskaja, 2013). New localities (M. Orlova and A. Bieńkowski leg.): 1) Nizhny Novgorod reg.: Bogorodsky Distr., Podyablonnoe Vill., wasteland, in litter under *Tanacetum vulgare*: 1♂, 1♀, on *Rumex*, 1 ♂, 1.8.2014; 2) Ryazan reg., Shilovo city, near Para river estuary, the edge of the forest belt, on *Tanacetum vulgare*, series of males and females, 08.2016, 08.2017. A host plant of this species is reliably recorded for the first time. In cages, beetles, collected in Nizhny Novgorod reg. and Ryazan reg., fed on leaves of *T. vulgare*, females laid eggs, beetles were alive during one month.

5. Bourdonné (2010b) resurrected *Chrysomela lobicollis* from synonymy with *Ch. poricollis* "based on study of the type material" and transferred *Ch. lobicollis* to the subgenus *Anopachys*. Therefore, the subgenus *Allohypericia* (with the type species *Ch. lobicollis*) was considered to be a junior synonym of the subgenus *Anopachys*. However, the note by Bourdonné (2010b) does not include any redescription, diagnosis, figures, material examined (including the labels and place of type deposition) of *Ch. lobicollis*.

I examined a type specimen (male) of *Ch. lobicollis* from MNHN. It should be regarded as a syntype, because Fairmaire (1887) did not record a number of type specimens, but not a "holotype" as J.-C. Bourdonné indicated on his identification label of 2002. Externally, a syntype of *lobicollis* is conspecific with *aurichalcea*. Aedeagus also fits within the limits of the intrapopulation variability of this species. In the syntype of *lobicollis*, the apical corner of the apex triangle of the aedeagus is perfectly smoothed (*Anopachys* figure 16: 1). However, among about 1000 specimens of *Ch. aurichalcea* studied by me from all range, I found similar shape of aedeagus in populations from different places, for example, from Kunashiri Isl., Altai Mts., Kazakhstan, Mongolia, and European Russia (*Anopachys* figure 16: 3–12).

Mikhailov (2021) wishing to clarify the taxonomic situation, did not request a type specimen from MNHN to designate the lectotype, but wrote: "<…> in the collection of NMPC [= NMP in the present study] I found another syntype of Chrysomela lobicollis, a female <…> that was studied by Bechyné (1950) [7e contribution…, comm. AB] because he mentioned the data from these labels. For the stability of the nomenclature according to Article 74 of the Code (ICZN, 1999) and because this has not been done before I designate this specimen as a lectotype of Chrysomela lobicollis". Specimen examined by Mihhailov (2021) is conpecific with Ch. aeruginosa poricollis.

In this regard, two questions arise: 1) can a specimen from NMP Prague belong to syntypes and, accordingly, be designated as a lectotype? 2) whether the specimen from NMP was actually known to Dr. J. Bechyné and was used by him to describe the subgenus Allohypericia?

Question 1. Below I compare a specimen from NMP (fig. 1), a specimen from MNHN (fig. 3), the labels with which these specimens are supplied (figs 2 and 4, respectively), and the original description (Fairmaire, 1887) (Table). Both specimens share most of the features from the original description. But there are also differences.

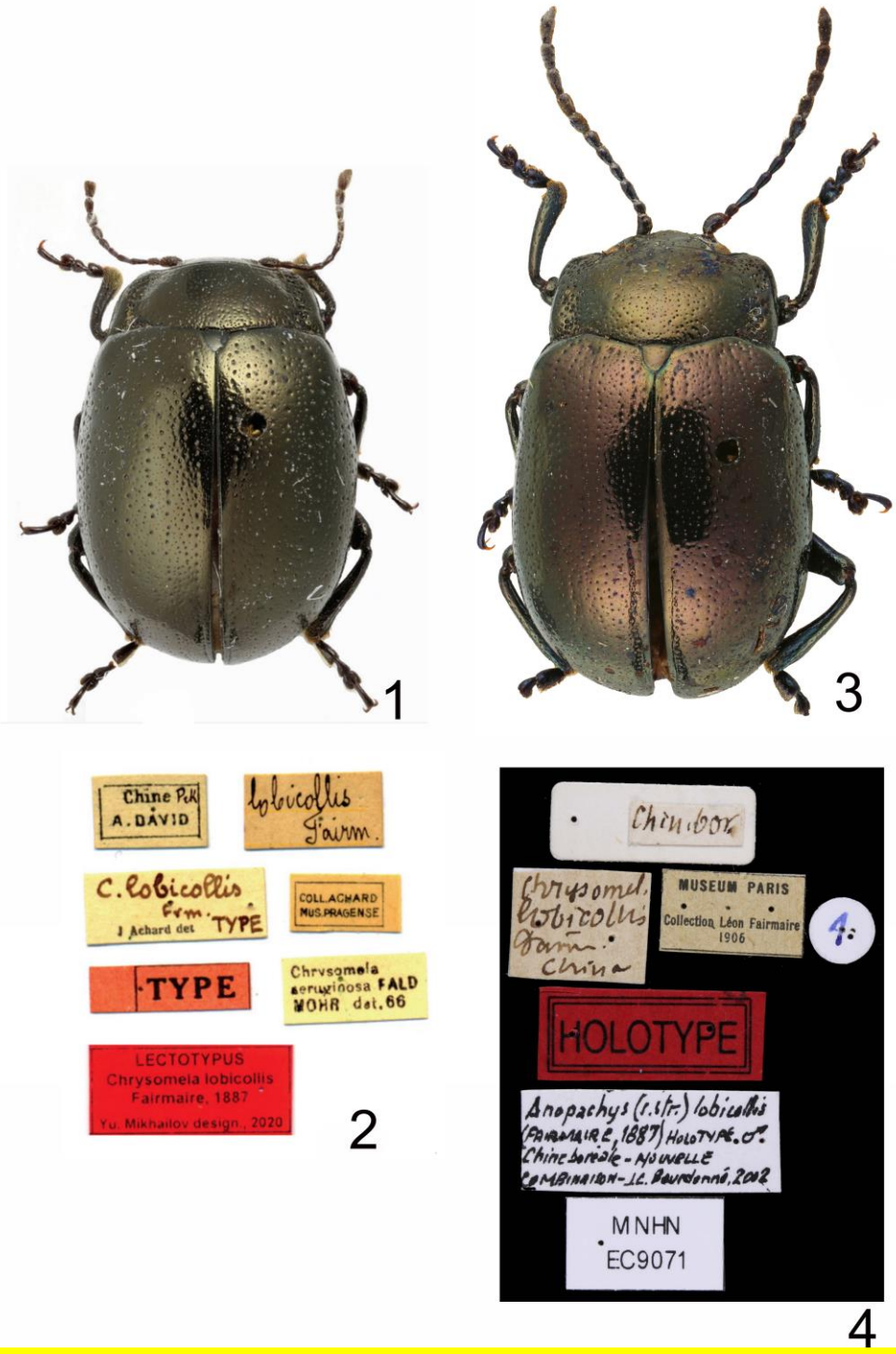


Figure: 1, 2 – specimen (female), labelled *Chrysolina lobicollis* in NMP, and its labels; 3, 4 – syntype (male) of *Ch. lobicollis* in MNHN, and its labels (After: Mikhailov, 2021: 1, 2; original photographies, © A. Mantilleri, MNHN: 3, 4)

Table. Comparison of the original description, specimens, and labels

Items for comparison	Specimen from NMP	Specimen from MNHN
Fairmaire (1887) original description		
postice vix sensim ampliata	no	yes
prothorace <…> lateribus parallelis	no	more or less
prothorace <…> ad latera longitudinaliter paulo impresso <…> basi profundius impresso	no	yes
scutello oblonge ogivali apice obtuso	no	yes
elytris <…> disco et apice cum seriebus confusis	no	yes
elytris <…> sutura apice dépressa	no	yes
Ressemble à la *C. gibbipennis*, mais plus oblongue	no	yes
le corselet a les côtés presque droits et parallèles	no	yes
diffère de celle-ci [Ch. aeruginosa, comm. AB] par <…> les antennes ayant les 5 premiers articles d'un bleuâtre foncé brillant	no	yes
Labels		
Original Fairmaire label	no	not excluded
Original label "type"	no	no
Fairmaire collection label	no	yes
Original locality label	yes	yes

As a result, I can conclude that the specimen from MNHN is compared well with the original description, while the specimen from NMP differs from the description. The specimen from MNHN belongs to a collection that deposits the types of Dr. L. Fairmaire, but the specimen from NMP does not.

When comparing the original labels ("lobicollis Fairm." (NMP) and "Chrysomel. Lobicollis Fairm. China" (MNHN)) and a sample of Dr. L. Fairmaire handwriting (Horn, Kahle, 1935–1937, T. 3: 24), it can be seen that the label from NMP has a smoother handwriting than the Fairmaire's one, while the label from MNHN may well have been written by the author.

Consequently, Mikhailov (2021) chose a specimen that did not belong to the type series to designate the lectotype. This specimen loses its lectotype status (ICZN, 1999, 74.2).

Mikhailov (2021) writes that he designates the lectotype "For the stability of the nomenclature". But in reality, his actions lead to the destabilization of the nomenclature. Knowing (Mikhailov, 2021, p.10, Remarks) that there is a syntype in MNHN, studied by two previous

authors (Bourdonné, 2010b; Bieńkowski, 2019), he chooses a specimen belonging to another species as a lectotype.

Question 2. We cannot say that the specimen from NMP was studied by Dr. J. Bechyné, since in the Bechyné article (see above) cited by Mikhailov (2021) there is no mention of this specimen, and the specimen is not supplied with any Bechyné label.

6. Having examined the specimens of *Ch. seriatopora* (redescription and figures are included in Bieńkowski, 2007a) (*Atlasiana* figure 1) – type species of the subgenus *Atlasiana*, and paratype (male) of *Ch. pourtoyi* (*Atlasiana* figure 2: 4) – type species of the subgenus *Mimophaedon*, and the original descriptions of the both mentioned subgenera, I found these two subgenera to be morphologically very similar. I could not find any character of a subgeneric rank distinguishing *Atlasiana* and *Mimophaedon*.

7. Through the kindness of M. Daccordi, I had a possibility to see the type specimens of *Ch. zangana* (*Chalcoidea* figure 14: 2), but only for a very short time. So, I unfortunately could not redescribe this species. Therefore, I cite the original description (Wang, Chen, 1981): "Subapterous. Narrowly ovate, general color purplish-black, mixed with aeneous gloss, shining. Pronotum finely and evenly punctate, the sides slightly thickened, the lateral depression obsolete but usually deeper near base where there are some coarse punctures. Elytra finely punctate, the punctures more or less regularly arranged in geminate rows, disappearing towards the apex. Length: male 5–5.5 mm, female 6 mm; breadth: male 3 mm, female 4 mm. Allied to *Chr. aeruginosa* Fald., both belonging to the same species group, distinguished by the elytra rather finely punctured with the interstices almost impunctate."

I can add to this description only the following: elytra with epipleura and lateral border dark rufous; pronotal lateral impression weak just near base, obsolete further in a forward direction; hind wings very reduced; in male tarsi some broader than in female, with entire sole, in female all tarsomeres 1 with glabrous stripe slightly not reaching the apex beneath; aedeagus is typical of *Chalcoidea* members; hind wings very reduced.

I examined a type specimen of *Ch. nyalamana* Chen et Wang, 1981 (*Chalcoidea* figure 17: 6). It shares the diagnostic characters of the subgenus *Chalcoidea*, without hind wings, aedeagus with apical projection and long narrow flagellum. In my opinion, it is similar with *Ch. zangana*.

I examined a holotype of *Ch. luchti*. Aedeagus of the holotype was prepared, but lost by someone earlier. A figure of the aedeagus is included in the original description (*Chalcoidea* figure 17: 5). I also examined additional specimens (one male (including aedeagus) and one female) belonging to *Ch. luchti* from Xinjiang (*Chalcoidea* figure 17: 1–3). I think, that characters of *Ch. luchti* fully corresponds to the characters of *Ch. zangana* and differs only in its coloration. Available specimens of *Ch. luchti* are dark bronze from above, with elytral epipleura and lateral ½ of extreme interval rufous.

8. Weise (1914) mentioned in the original description of *Chersomela* that this taxon differs from all other Chrysomelinae by the structure of prothorax, namely, by deep furrow along entire length of lateral side. However, such shape of prothorax presents in the most members of the former subgenus *Polysticta* of the genus *Chrysolina* (see Review of the subgenus *Chersomela* (= *Polysticta*).

30 specimens being at my disposal mostly correspond to original descriptions of both, genus *Chersomela* and the type species, *Ch. hottentotta,* and differ in the presence of setiferous pores and

setae at anterior and posterior angles of pronotum and the presence of setae at elytral epipleuron near apex (*Chersomela* figure 49). Obviously, these characters were overlooked by Weise (1914).

The single species of the genus *Chersomela*, namely *Ch. hottentotta*, shares all diagnostic characters of the former subgenus *Polysticta* (27 species): anterior tarsal cavities open, elytral epipleuron ciliate apically, last maxillary palpomere cone-shaped, truncate apically, prothoracic hypomeron with sharp, deep furrow along entire length laterally, elytron with 11 puncture rows (1st row abbreviated, 11th row adjoins to upper side of epipleuron), hind wings normally developed, pygidium with medial furrow along almost entire length except near apex, last tarsomere simple, without denticles, tarsal claw with projection at inner side near base, pronotum without any lateral impression, with numerous, dense, large punctures laterally, and with dense, moderately large punctures at disc, elytral epipleura posterior to middle horizontal and invisible in lateral view there. Elytra metallic with symmetrical yellow pattern. Therefore, I think *Chersomela* to be a junior synonym of *Polysticta*.

However, the name *Polysticta* Hope, 1840 is a junior homonym of the valid name *Polysticta* Eyton, 1836 (Aves). Therefore, valid name for the subgenus of the genus *Chrysolina* is *Chersomela* Weise, 1914 according to ICZN (1999, 23.3.5).

9. The original description of the subgenus *Lithocrosita* was included by Medvedev (1982) in the key to species of the genus *Chrysolina* of Mongolia. *Chrysomela rugulosa* Gebler was originally designated as a type species of *Lithocrosita* on the base of monotypy. Mikhailov, Bourdonné (2005) examined a type specimen of *Ch. rugulosa* Gebler and found that the recent interpretation of this taxon (Medvedev, 1982; Medvedev, Dubeshko, 1992; Bieńkowski, 2007a) is incorrect. Really, *Ch. rugulosa* Gebler is not a species of the genus *Chrysolina*, but member of the genus *Crosita* and conspecific with *Crosita longipes* Jacobson. On this basis, the name *Lithocrosita* was included by Kippenberg (2010) in the synonymy of *Crosita*. However, Medvedev (1982), when he established a new subgenus *Lithocrosita*, mentioned diagnostical characters which definitely indicate its belonging to the genus *Chrysolina*, and published a figure of aedeagus of the type species, *Ch. rugulosa* sensu Medvedev. This aedeagus is quite different from the aedeagus of *Crosita longipes*, pictured in the same book (Medvedev, 1982), but similar to aedeagus of *C. concinna* Weise (type of *C. concinna* was studied by Mikhailov, Bourdonné, 2005). On the base of that, I come to conclusion: Medvedev (1982) unintentionally erroneously identified *C. concinna* Weise as *Ch. rugulosa* Gebler. I use ICZN (1999, 70.3) for the stability of the nomenclature and designate *Crosita concinna* as a type species of the *Lithocrosita*. Therefore, *Lithocrosita* is a subgenus of the genus *Chrysolina*, but not a synonym of *Crosita*.

10. Bechyné (1950a) proposed *Ch. stachydis*, *Ch. fragariae*, and *Ch. coerulipes* to be the members of the subgenus *Chrysolina* s.str.

Ch. (*Stichoptera*) *stachydis* differs from the members of the subgenus *Chrysolina* s.str. in last maxillary palpomere narrow, oval, not broader than penultimate, elytra with dense regular rows of large punctures, and aedeagus typical of the subgenus *Stichoptera*: strongly curved, bearing distinct apical denticles on ventral side, and protruding medial lobe of apical opening (looks like fish mouth in lateral view) (*Stichoptera* figure 21).

Ch. (*Rhyssoloma*) *fragariae* differs from the members of the subgenus *Chrysolina* s.str. in the outstanding relief of elytral lateral sides (impressed and irregularly wrinkled, looks like monstrosity), and last maxillary palpomere narrow in both sexes, not broader than penultimate (*Rhyssoloma* figures 1, 7).

Ch. (*Pierryvettia*) *coerulipes* differs from the members of the subgenus *Chrysolina* s.str. in pygidium bearing distinct longitudinal furrow with sharp borders, last maxillary palpomere narrow, and prothoracic hypomeron bearing sharp border laterally.

11. The species *banksi* was originally described under the name "*Bankii*" (capital letter "B" means that the species named after a personal name). Later it was cited as "*bankii*" (e.g., Warchałowski, 1993, 2003; Kippenberg, Döberl, 1994; Bieńkowski, 2001), or "*banksi*" (e.g., Marseul, 1886; Reitter, 1912; Weise, 1916; Porta, 1934; Bechyné, 1950a; Mohr, 1966b), or "*banksii*" (e.g., Herrich-Schaeffer, 1839; Motschulsky, 1860a). Fabricius (1775) has not explained certainly the ethimology of this name, however he noted "Mus. D. Banks" as a place of the type deposition [museum by Dr. Banks]. The above-mentioned arguments are sufficient to allow conclusion that this species was named after J. Banks (1743–1820), the famous English naturalist. Therefore, "*Bankii*" is an incorrect original spelling (ICZN, 1999, 31.1.2, 32.5.1.), and "*banksi*" is a justified emendation (ICZN, 1999, 33.2.2).

12. The name *phaeaca* Jolivet, 1951b was proposed as substitute name for *corcyraea* Jolivet, 1951c, nec Bechyné, 1950a. I have not found the name *corcyraea* in the paper by Bechyné (1950a) mentioned by Jolivet (1951b). I believe, Jolivet (1951b) meaned "*Chrysolina geminata* m. *corcyria* Suffr." (Bechyné, 1950a, p. 155). The names "*corcyraea*" and "*corcyria*" are not homonyms (ICZN, 1999, 58). Therefore, the name *phaeaca* is an unjustified substitute name. It is available (ICZN, 1999, 10, 6).

13. I examined a number of specimens from Tenerife Isl., together with both, *Chrysomela costalis* Olivier, 1807 and *Ch. obsoleta* Brullé, 1838 original descriptions. Four elytral alternative intervals were described by Olivier (1807) for *costalis* as "peu élevées" and by Brullé (1838) for *obsoleta* as "légères". However, the shape of elytral intervals 3, 5, 7, and 9 individually varies from wholly flat (in most specimens) to slightly convex. Therefore, I believe *obsoleta* to be new junior synonym of *costalis*.

14. The subspecies *Ch. staphylaea arthritica* was originally described as following: "Diffère de la race typique par la taille allongée et à peine ventrue chez les deux sexes. La surface est brillante et la ponctuation générale plus éparse. Long. males 6,5–7 mm; female 8 mm." (Bechyné, 1950a). I examined four syntypes (3 males, 1 female) (*Chrysolina* s.str. figure 12) and one more male from Faeroes Isls. (Strömö, Steinböck leg.). These specimens are really elongate (body length / width = 1.58–1.66) and shining, however, they are wholly similar with some of the available specimens of *Ch. staphylaea* from different localities including Austria (Vienna, Styria, Gailtaler Alps), Russia (Kaliningrad reg., Moscow reg.). Therefore, I believe *arthritica* to be a junior synonym of *staphylaea*. This synonymy was suspected before by Jolivet (1990).

15. Lopatin (1977), Lopatin, Kulenova (1986), recorded the subspecies *Ch. staphylaea daurica* from forest-meadow mountain slopes of Tien Shan (Trans-Ili Alatau, Dzhungar Alatau, Saur ridge, Tarbagatai ridge, Kungei Alatau, Sarydzaz ridge). I examined specimens of *Ch. staphylaea* from Tien Shan (Alma-Ata, Kungei Alatau, Saur ridge, Issyk Kul lake, Przhevalsk), Altai, and Irkutsk reg. All of them belong to the nominotypical subspecies.

I found in ZIN (coll. by Rybakow) a specimen labeled as: "*daurica* Gebl. (Type) S.W. Baical col. Motsch." It is not a type specimen. Gebler (1832) in the original description of *Chrysomela daurica* mentioned neither the type locality, nor the quantity of type specimens. But the title of the article says that it is devoted to the beetles collected in the environs of Nerchinsk (Transbaikalia).

Besides that, Gebler (1832) separates *Ch. daurica* from *Ch. staphylaea* as follows: "Caeterum simillа *Ch. Staphyleae*, at propter pincturam multo profundiorem et nitorem minus aeneum vix ejus varietas". The above-named specimen in ZIN shares characters of the typical *Ch. staphylaea* s.str. (dorsal side with bronze tint, elytral puncturation fine, not wrinkled).

This subspecies is recorded from S. Korea (Jeju Isl.) by Cho, An (2020).

16. *Ch. staphylea* var. *sharpi* was originally described from salt marshes of Irish sea (Great Britain, Cumbria) as follows: "<...> no metallic reflection, and the head and disc of thorax nearly impunctate; the double rows of punctures on the elytra are coarser and more distinct, and the general size is smaller"; "<...> dull ferruginous with the thorax usually darker" (Fowler, 1890).

I have not any specimens of this taxon from the type locality of *sharpi*. However, I found an unusual form of *Ch. staphylaea* which, probably, belongs to the subspecies *sharpi*, at White Sea shore: Kandalaksha bay and Solovki Isls. I observed it at Kandalaksha bay shore near the Polar Circle in 1987–1990 and 2015. It inhabits salt littoral meadows and supralittoral. Adults and larvae feed on halophytes: mostly on *Plantago salsa*, sometimes also on *Aster tripolium* and *Atriplex* sp. (all host plants were confirmed in the cages). It differs from the nominotypical subspecies in dorsum rufous, weakly shining or dull, without any trace of the bronze reflection, and from the subspecies *sharpi* in pronotal discal punctures distinct, fine (as in nominotypical subspecies). Specimens of the nominotypical subspecies were found in the same areas, Murmansk region and Karelia, but never in the sea littoral meadows. *Ranunculus acris*, *R. repens*, and *Plantago major* were found to be the host plants of the nominotypical subspecies there.

It is interesting that another leaf-beetle species, *Longitarsus plantagomaritimus* Dollmann, 1912, was found on *Plantago salsa* in the same salt littoral meadows of Kandalaksha bay (Bieńkowski, 1997). This species was known before only from the North Sea shores (Great Britain and continental Europe).

17. The original description of *Ch. fasciata* was published (Fourcroy, 1785) in the general list of the species of the genus *Chrysomela*, in which the generic name of each taxon was indicated by abbreviation "*C.*", but the taxon in question was named with typographical error: "*B. fasciata*".

18. Schrank (1789) described *Ch. goettingensis* with the reference to "*Chrysomela goettingensis*. Lin. S.N. 586.4." *Chrysomela goettingensis* Linnaeus, 1761 was suppressed later as a synonym of *Ch. fuscipes* Gmelin, 1790. However, *Chrysomela goettingensis*: Schrank is a misidentification, and, therefore, unavailable (ICZN, 1999, 49).

19. *Chrysomela unicolor* Suffrian, 1851was originally described from Italy and distinguished from *Ch. haemoptera* in body more narrowed posteriorly and less convex, especially in male. Weise (1916) offered a replacement name *corvina* for *unicolor* Suffrian, because of the homonymy with *Ch. unicolor* Gebler, 1845.

20. Piolti (1880) described from Italy a new species *Chrysomela Camerani* and noted that it was dedicated to Lorenzo Camerano. Therefore, "*Camerani*" is an incorrect original spelling (ICZN, 1999, 32.5.1). It was corrected by Weise (1916) to "*cameranoi*".

Weise (1916) considered *cameranoi* to be a color aberration of *Ch. haemoptera* var. *corvina* despite the fact that *cameranoi* was described earlier. I believe *cameranoi* to be conspecific with *corvina* Weise (= *unicolor* Suffrian), because both these names belong to the intraspecific form of *Ch. haemoptera* occurring in Italy.

21. Weise (1882) studied *Ch. vernalis* and described "Var. f. Corpore subgloboso, supra nitida. *Chr. turca* Fairm. Ann. Fr. 1865. 74". Then, Weise (in: Heyden, Reitter, Weise, 1906) offered a substitute name *vernalis* ab. *ottomana* for *turca* Weise, 1882 nec Fairmaire, 1865. Therefore, Weise indicated that "*turca*" sensu Weise, 1882is a misapplication of the name *turca* Fairmaire. According to ICZN (1999, 49), *turca* Weise, 1882 is an unavailable name. This name should be replaced (ICZN, 1999, 23.3.5). Bechyné (1950a) used the name *ottomana* as a subspecies: *Ch. vernalis ottomana*. According to ICZN (1999, 45.5.1) the author of the name *ottomana* is Bechyné, 1950a, but not Weise, 1906.

Jolivet (1951b, c) revised *Ch. haemoptera* and distinguished the following subspecies: 1) nominotypical subspecies, 2) subspecies *corvina* (=*cameranoi*, =*unicolor*), and 3) subspecies *ottomana* (= *byzantia*). He used the following distinguishing characters: dorsal coloration, body shape, elytral puncturation, and body length in male and female separately (Fig. 1).

Figure 1. Characters of the subspecies of *Ch. haemoptera,* according to Jolivet (1951c).

characters	*haemoptera* s.str.	subsp. *corvina*	subsp. *byzantia*	subsp. *persica*
dorsal coloration	blackish blue, shiny	blackish blue, bright, lacquer-shiny	usually black opaque, rarely blue weakly shiny	blackish blue or bronze, weakly shiny
body shape	hemispherical strongly convex	less hemispherical than in s.str.	oval, elongate, rather weakly convex	oval, broader than in *byzantia*, weakly convex
elytral punctures	small and sparse in intervals of the rows	smaller than in s.str.	obsolete	moderately large, shallow, but distinct; intervals of the rows very finely punctate
body length ♂, mm	6	8	7–8	8
body length ♀, mm	8	9–10	8–9	9
distribution	Europe from Sweden, Denmark, England to Greece, from Iberian Penins. to Eur. Russia	Italy with Isls. (Elba, Corsica, Sardinia, Sicily), S France (Alpes-Maritimes)	Turkey	Iran (Elburs Mt.)

I studied 339 specimens of *Ch. haemoptera* from all parts of the specific area. Specimens from Italy and Turkey do not differ by the body shape (ratio of length and width; convexity) from that from other regions of Europe (Figs 2, 3). Body length in the specimens from Italy, on average, is larger than from other regions of Europe (Fig. 4). However, only 4.2 % of females and 17.6 % of males from Italy are larger than the specimens of the respective sex from other regions of Europe. This level of differences is less than subspecific level (more than 75% specimens from the area of any subspecies should be correctly identified as the respective subspecies, after Mayr, 1971). Shine of the dorsal side (just shiny or lacquer-shiny) in the specimens from Italy does not differ from that in the specimens from other regions. Elytral puncturation varies from fine to moderately large in the beetles from different regions, but the specimens from Italy do not differ from others by this character. The largest elytral puncturation is found in the specimens from Spain and several specimens from Portugal, Balkan Penins. and Crimea. Among the color variations of dorsal side, blue specimens dominate in all parts of Europe, violet ones present in much less quantity there, black ones present in less quantity than violet ones or absent (Fig. 5). 45 % specimens from Turkey are black. Such a level of difference is not enough to separate a subspecies. Therefore, I came to conclusion that *Ch. haemoptera* has not any distinct geographical forms (subspecies) in Europe and Asia Minor.

Comments

I studied a male (holotype) and a female (paratype) of *Ch. haemoptera persica*. The male is blue, the female is black with a weak bronze violet shine.

I have not studied any other specimens of this species from Iran. *Ch. haemoptera* absents in the faunistic lists of *Chrysolina* from Iran (Berti, Rapilly, 1973; Medvedev, 1983; Lopatin, 1981; Lopatin, 1985; Ghahari, Hawkeswood, 2011). The species is distributed in Europe and Asia Minor, it absents in N Caucasus (Okhrimenko, 1992) and Armenia (Ter-Minasian, M.E., 1950). The finding of *Ch. haemoptera* in Iran is doubtful.

Chrysolina haemoptera persica Jolivet as well as *Chrysolina coerulea azurea* Bechyné has been described based on the specimens with quite similar printed typographic label "Elbrus Geb. Perzien Rtt." In both cases, the subspecies was described from a region far from the range of the respective species, and, in both cases, the mentioned species have not been collected in Iran once more by anyone. I could not find any morphological differences between the type specimens of *Chrysolina haemoptera persica* Jolivet and available specimens of *Ch. haemoptera* s.str., as well as any differences between type specimens of *Chrysolina coerulea azurea* and available specimens of *Ch. olivieri olivieri*. I believe that the geographic label of the type specimens of *Chrysolina haemoptera persica* Jolivet and *Chrysolina coerulea azurea* is erroneous. (see also Comment 216).

Figure 2. Ratio of elytral height and body length in *Ch. haemoptera* (mm).

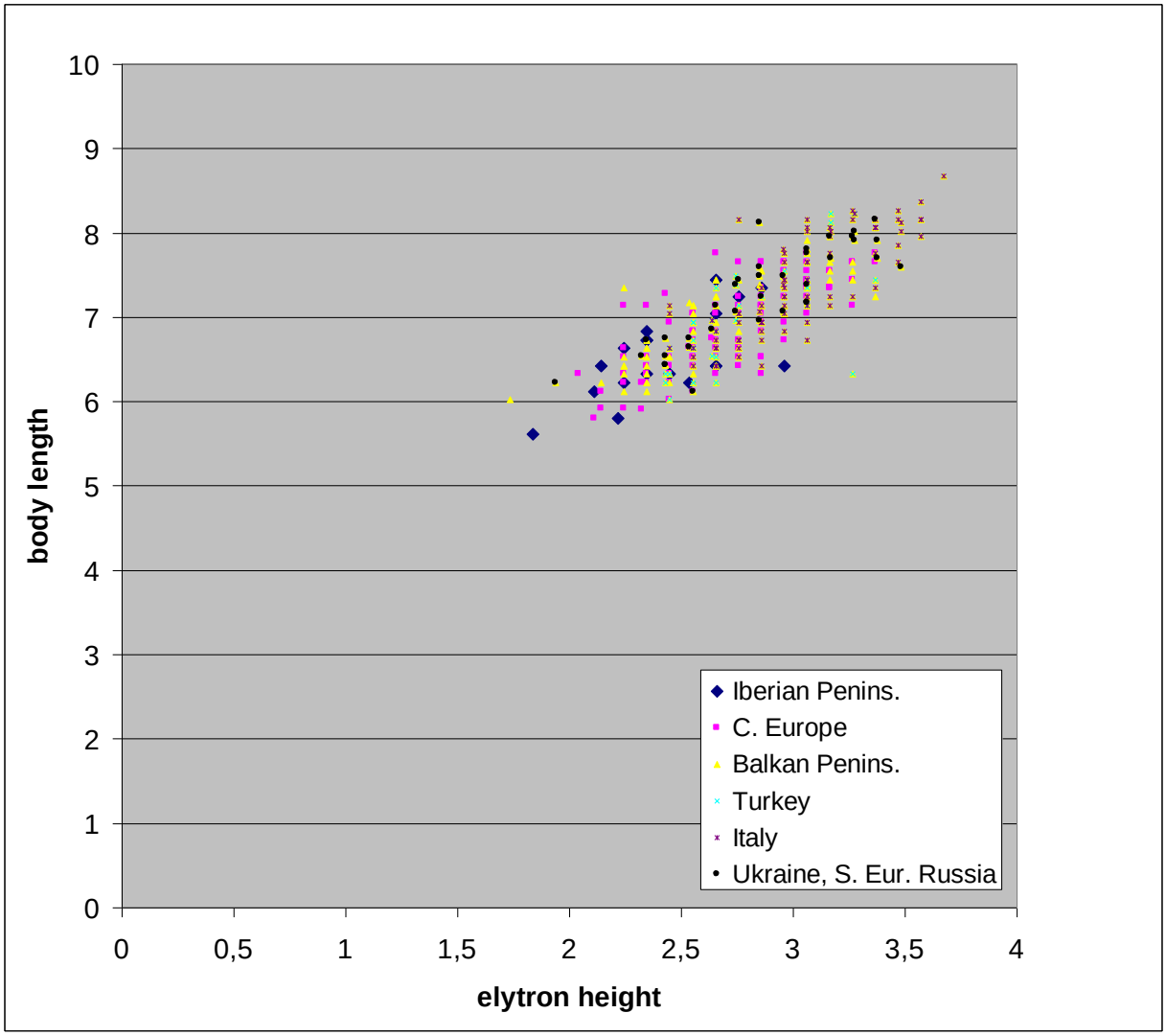


Figure 3. Ratio of body length and width in *Ch. haemoptera* (mm).

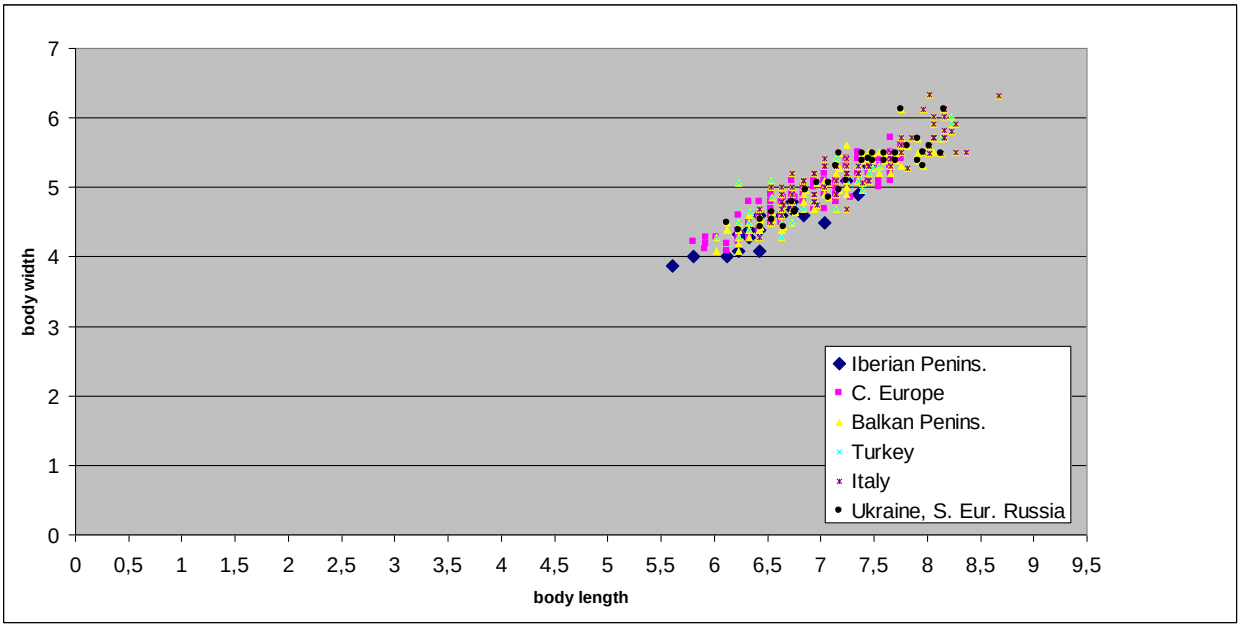


Figure 4. Body length (minimal, average, maximal) in *Ch. haemoptera* (males – "m", females – "f") from different parts of area. Number of specimens examined are in brackets.

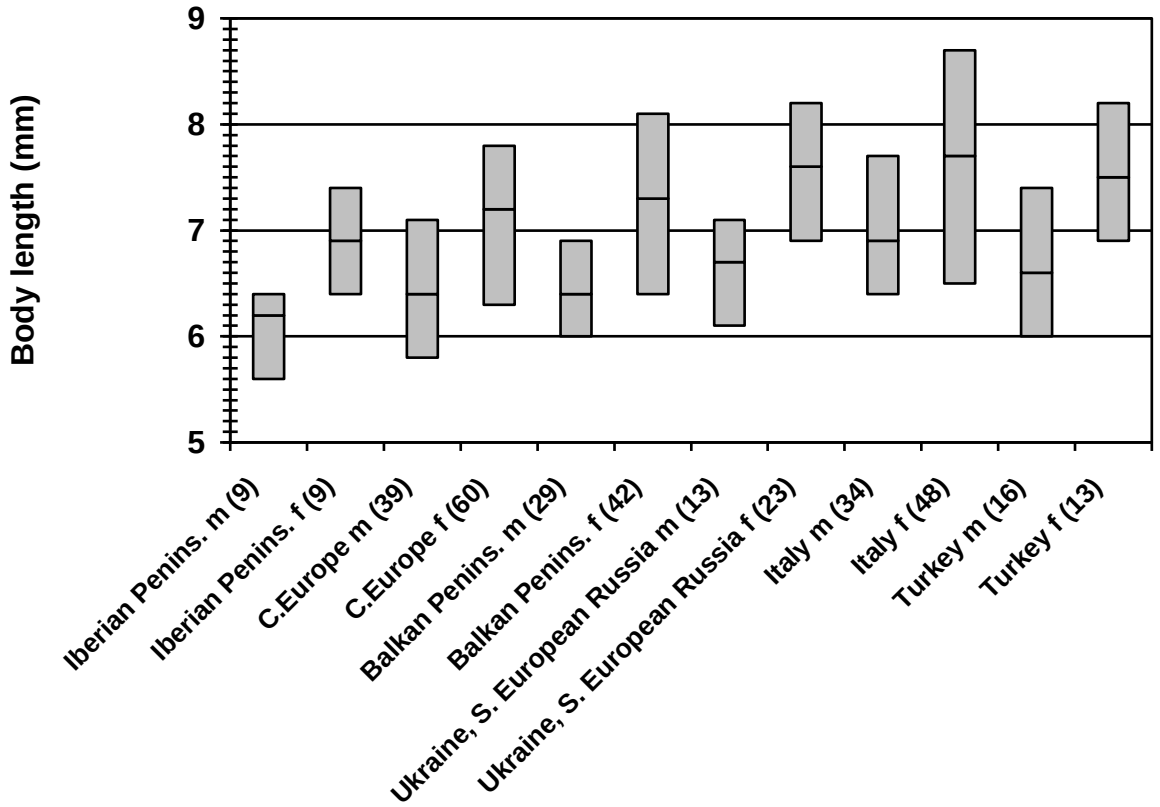


Figure 5. Dorsal coloration in *Ch. haemoptera*.

color	Iberian Penins.	C Europe	Balkan Penins.	Ukraine, S Europ. Russia	Italy	Turkey
blue	17	81	59	32	67	12
violet	1	15	11	4	10	5
black	-	3	1	-	7	14

22. Bechyné (1950a) described *Ch. purpurascens* var. *plumbeonigra* with reference to the former original description of this variation by Reitter (1912). However, Reitter (1912) described *Chrysomela crassimargo* ab. *plumbeonigra*, which is unavailable. Therefore, the name *plumbeonigra* is available with the authorship by Bechyné (1950a) (ICZN, 1999. 45.5). The name "*plnmbeonigra*" in the original description by Bechyné (1950a) on page 115 is an incorrect original spelling (ICZN, 1999. 32.5.1), this name was published correctly (*plumbeonigra*) in the same publication on page 183.

23. *Chrysolina sturmi* is widely distributed and varies in body coloration. According to literature data (Westhoff, 1882; Weise, 1884a; Bedel, 1892; Reitter, 1912; Bechyné, 1950a; Warchałowski, 1993, 2003), there are three forms with different coloration: 1) *sturmi* s.str. is dark bronze, 2) *diversipes* (= *goettingensis*) is violet, and 3) *polonica* is bluish green or golden green.

I studied several hundred specimens and came to conclusion (Fig. 6).

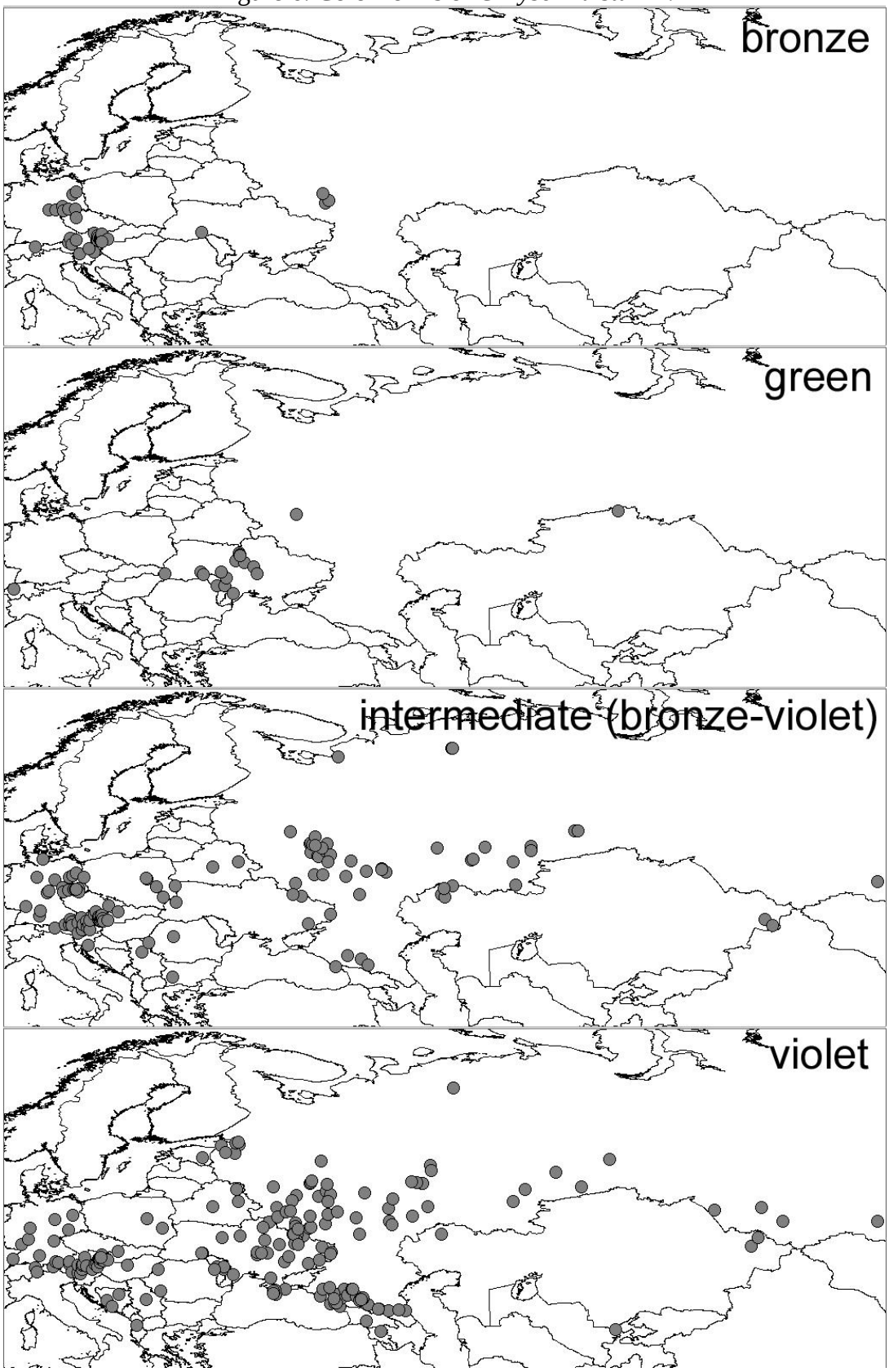
– form *diversipes* is distributed across the whole specific area,

– form *sturmi* inhabits mostly W Europe, it occurs almost always together with *diversipes* in the same places,

– intermediate color forms (body is entirely violet ventrally, and violet dorsally with more or less distinct bronze coloration on elytra and pronotum) occur in the whole specific area together with forms *sturmi* and *diversipes* or separately. The presence of these intermediate forms, together with the absence of any other differences between *sturmi* and *diversipes*, permit me to include them in the same subspecies,

– form *polonica* is found almost only in Podolsk and Pridneprovskaya uplands with the adjacent territories. Form *diversipes* is rare and others absent there. Therefore, I consider form *polonica* to be subspecies. Finding of form *polonica* in Switzerland and North-Kazakhstan region (one specimen from each region) may be the result of the label mistake or the extreme variability of violet form. This does not contradict the subspecies criteria.

Figure 6. Color forms of *Chrysolina sturmi*.



24. *Chrysomela fuscipes* Gmelin, 1790 was originally described as follows: "*Chr. violacea*, antennis tibiis plantisque fusco-ferrugineis". It is probably a valid name for the taxon well known under the name *Ch. sturmi*. However, the description by Gmelin (1790) is very short, and the type of *fuscipes* is probably lost. It does not permit us to make the certain decision about the name *fuscipes*.

25. *Chrysomela hemoptera* Fabricius, 1792is unavailable name because of incorrect identification (ICZN, 1999, 49). The name was supplied with the reference: "*Chrysomela haemoptera* Linnaeus, 1740, Systema naturae, 2 ed., p. 587" However, the description by Fabricius (1792) included the following characters: "... ovata violacea plantis alisque rubris". I think, this taxon is conspecific with *Ch. sturmi*, but not with *Ch. haemoptera* Linnaeus.

26. The name *Chrysomela violacea*, conspecific with *Ch. sturmi*, is usually cited with the authorship by O.F. Müller (1776) (Zool. Danie. Prodr. p. 81) e. g., by Weise (1916), Medvedev, Shapiro (1965), Brovdij (1977). However, Müller (1776) did not suggest a new name. He wrote only the following: "Chr. *Göttingensis* ovata, violacea; tarsis ferrugineis".

27. I examined numerous specimens, belonging to the subgenus *Diachalcoidea*, from different localities of Near East and came to conclusion that the names: *rufomarginata* Baly, *rufomarginata* Marseul, *palmyrensis* (with subspecies *assurensis*), and *aegyptiaca* (with subspecies *aleppensis*) belong to the same taxon widely distributed in this region. Examined material includes 65 specimens, including, syntype (?) of *aegyptiaca*, syntypes of *rufomarginata* Baly (*Diachalcoidea* figure 13), holotype of *aegyptiaca aleppensis*, holotype and paratype of *palmyrensis palmyrensis* and holotype of *palmyrensis assurensis*. Size and shape of body, and elytral puncturation some differ in the individuals; however, I could not separate geographical subspecies. Aedeagus shape is the same in the all males examined; and all females have narrow glabrous stripe on the lower side of mid- and hind-tarsomere 1.

Despite the fact that Bechyné (1955b) in the original description of *Ch. palmyrensis* writes: "Chez les ♀♀, c'est seulement le 1er article des tarses postérieurs qui est faiblement sillonné en dessous", Warchałowski (2003) erroneously notes: "In female underside of first mid- and hind tarsomere entirely covered by short setae, without a median nude stripe".

28. Lopatin (2010) placed the name *badakhshanica* in the synonymy of *Ch. sacarum* with neither reference to the examination of the type of *badakhshanica*, nor any explanation of this point of view. I examined two specimens of *badakhshanica* from the collection by S. M. Iablokoff-Khnzorian, namely one female (syntype) and another male (topotype). I think this name to be a synonym of *Ch. sacarum*. Both specimens are supplied with the "syntype" label, but male with the original label "Ванч. 2300 склон Памир. 18.6.75" can not be considered as a member of the type series, because the types were collected on June, 17, but not 18 (Iablokoff-Khnzorian, 1978).

The figure of aedeagus of *badakhshanica* in the original description (Iablokoff-Khnzorian, 1978) differs from that typical of *Ch. sacarum* because of the figure in question was evidently made from immature deformed aedeagus: a projection at mid-length of lower side, which is characteristic of *Ch. sacarum*, is unclear there. A male, topotype, being at my disposal has such deformed aedeagus.

29. According to the original description, *Chrysomela artemisiae* was collected at Don riversides in Aksai city (Rostov reg.) and at Kuban river (Motschulsky, 1860a). However, the single specimen of *Ch. artemisiae* found by me in V.I. Motschulsky collection (ZMMU) is supplied with the label

"Camp. Kirgis." [= campus Kirgisia]. "Campus Kirgisia" is a territory from Ural river to Tien Shan foothills and from the Aral Sea to the northern border of Kazakhstan.

Such characters as: the size of pronotal and elytral punctures, relief of elytron (more or less wrinkled intervals of punctures), shape of pronotal lateral side (rounded or angulate; with emargination before base or without it), development of lateral impression of pronotum (absent or present) are variable in the specimens from the most part of the specific area of *Ch. graminis* with exception of the Far East.

Characters, included in the original description of *Ch. artemisiae*, as well as distinguishing characters of *Ch. graminis artemisiae* and *Ch. graminis graminis* in the subsequent publications (Fig. 7) are variable and do not permit to separate the specimens originated from the areas of these two forms. Therefore, I consider *artemisiae* to be a junior synonym of *graminis*.

Figure 7. Distinguishing characters of *Ch. graminis artemisiae* and *Ch. graminis graminis* mentioned in the literature sources.

Ch. graminis artemisiae		*Ch. graminis graminis*		References
area	characters	area	characters	
N Mongolia, S Siberia, Kazakhstan, C Asia, S-E Europe	pronotal lateral callus undeveloped or very weak	Europe, Siberia		Medvedev, 1982
Uzbekistan, Altai, Tuva, Mongolia, steppe and forest-steppe zones of Kazakhstan	pronotal lateral callus distinct, especially near base			Lopatin, 2010
Altai, Tuva, Kazakhstan, Mongolia	pronotal lateral callus very weak, but visible, especially near base; dorsal punctures coarser and more wrinkled.	Europe, W Siberia, Sayans, Central Siberian Plateau, Yakutia, Arctic	pronotal lateral callus absent or hardly visible; dorsal punctures less coarse and less wrinkled	Medvedev, Dubeshko, 1992
South of European part of USSR, Volga valley, Altai, W and C Kazakhstan, Uzbekistan, Mongolia	pronotal lateral callus narrow, weakly convex, separated from disc by coarse, hollow-like punctures.			Lopatin, 1977
Russie mérid.: Rostov, Cherson, Berislav, Crimée, Tockoe, Gub. Samara, Simbirsk; Taschkent, Bijsk, Gub. Tomsk, Turkestan	ressemblant beaucoup à la race typique, clypéus moins transversal et les élytres ponctués fortement, rugueux surtout au tiers apical	Europe tempérée sauf au Midi.	ponctuation des élytres très variable, parfois assez éparse, parfois; presque rugueuse	Bechyné, 1950a
Stepowe i leśno-stepowe obszary Europy Wschodniej oraz Azję Srodkową.	wałeczkowate zgrubienie brzegów bocznych mało wydatne		zgrubienie boków przedplecza bardzo słabe, ale dostrzegalne	Warchałowski, 1993
Sur les bords du Don, à Aksai, et sur ceux du Kouban près de la péninsule de Tanain.	elle ressemble beaucoup <…> *Ch. graminis*, mais elle est généralement plus courte, avec un corselet plus déprimé, plus trapézoidal, moins arqué sur les côtés, et les élytres plus fortement ponctuées et presque rugueuses			Motschulsky, 1860a
Ukraine, southern Russia, Central Asia	lateral borders of pronotum in hind part distinctly swollen	Europe except Ukraine, S Russia, and Mediterranean reg.	lateral borders of pronotum feebly swollen, but perceptible	Warchałowski, 2010

30. I studied specimens from the type locality of both, *Ch. graminis santonici* (Venezia) and *Ch. graminis mediterranea* (Corsica Isl.) together with material from different parts of Mediterranean region. All of them similar and belong to the same subspecies, *santonici*.

Bechyné (1950a) mentioned the type label of *Ch. graminis mediterranea* as follows: "Corse (serie typique, coll. Achard, Mus. Nat. Prague)". I could not find any type specimens in NMP, however, I found in NMB one female with labels: "Corsica 1905 Folelli Coll. O. Leonhard / Chr. graminis ssp. mediterranea m. det. J. Bechyne 1950". It is probably a syntype.

31. Schrank (1798) offered a new name *galeopsidis* for the taxon, which was known to him under the name *Chrysomela speciosa* Linnaeus. According to Schrank (1798), the name *galeopsidis* is better suited for this taxon because it refers to its host plant (*Galeopsis*). However, the characters from the description by Schrank (1798): "eyförmig...", "auf den Arten des Hohlzahns..." permits us to consider that F.P. Schrank described a taxon which is conspecific with *fastuosa* Scopoli, but not *speciosa* Linnaeus. Host plants of *Oreina speciosa* (Linnaeus) are *Chaerophyllum hirsutum* and *Anthriscus* (Apiaceae) (Dobler et al., 1996).

32. Bechyné (1950a) described "*Dlochrysa fastuosa fastuosa* ab. *jodasi*". Then, Csiki (1953) described "*Chrysomela fastuosa* var. *biroi*". Bechyné (1954b) offered a new synonymy: "*Dlochrysa fastuosa jodasi = Chrysomela fastuosa biroi*". The name *jodasi* Bechyné, 1950a is intrasubspecific and therefore unavailable, but the names *biroi* Csiki, 1953 and *jodasi* Bechyné, 1954b are available (ICZN, 1999, 10.2; 45.5.1; 45.6.4.).

33. J. Bechyné described a new subgenus with the same type species but with different original spellings two times in the same year. Article by Bechyné (1950c) was published on 30.12.1950, and article by Bechyné (1950a) – on 31.12.1950. Therefore, *Ghesquiereita* Bechyné, 1950c is an objective senior synonym of *Ghesquierita* Bechyné, 1950a, but they are not homonyms (ICZN, 1999, 56.2).

34. Bechyné (1949b) described *Chrysolina cuprina cuprina* ab. *nigritula*; and Csiki (1953) described *Chrysomela geminata* ab. *lugubrina*. Both names, *nigritula* Bechyné, 1949b and *lugubrina* Csiki, 1953, are intrasubspecific and unavailable (ICZN, 1999, 10.2). Then Bechyné (1954b) used the name "*nigritula*" for the subspecies as "*cuprina nigritula*". Therefore, the name *nigritula* Bechyné (1954b) is available (ICZN, 1999, 10.2; 45.5.1). The name *lugubrina* Bechyné, 1954b (mentioned as "*Chrysomela geminata lugubrina* Csiki") is originally published as a junior synonym and therefore unavailable (ICZN, 1999, 11.6).

35. Weise (1887a) described under the name "*Chrysomela aeruginosa* Fald." the species which is conspecific with *difficilis* Motschulsky (but another subspecies), but not with *aeruginosa* Faldermann. Therefore, the name *Chrysomela aeruginosa* sensu Weise, 1887a is unavailable (ICZN, 1999, 49). Jacobson (1901b) offered new name *ussuriensis* as following: "*Chr. aeruginosa* Ws. 1887 est species propia Ussuriensis, cum *Chr. aeruginosa* Fald. parum commune habens; quam hic *Chr. ussuriensis* nom. nov. renomino". Really, the name *ussuriensis* is not *nomen novum*, because it was not offered for the replacement of any senior available name (ICZN, 1999, Glossary of terms), but for the "replacement" of the name which is unavailable because of incorrect identification. A new name *ussuriensis* Jacobson is not accompanied with the description, but with indication ("*Chr. aeruginosa* Ws. 1887"), and therefore, available. The type locality of *ussuriensis* is a type locality of *aeruginosa* sensu Weise. It is Amur river.

Comments

36. The original description of *Chrysomela nepalensis* is very brief: "Nigro violacea thorace purpurascenti elytris aeneoviolaceis et punctatis, punctis majoribus quibusdam seriatis et atris" (Hope, 1831). The word "punctis" implies here the elytral smooth plates but not puncturation. Gebler (1817, 1830, original descriptions of *Ch. guttata* and *Ch. musiva*, respectively) used the word "punctis" in the same sense. I examined one specimen (MC) which was compared by L.N. Medvedev with the type of *Ch. nepalensis* and think this name to be conspecific with *exanthematica*.

37. Chûjô (1958) separated a new species *Chrysolina laeviguttata* from *Ch. exanthematica* in the following characters: "The body more strongly widened posteriorly, the puncturation on the dorsum finer and much more sparsely settled, and the serial impunctate spots on the elytra much less in number (in Wiedemann's species the number of those spots are about 50) and not so rounded." The original description of *Ch. laeviguttata* includes the following characters: "Elytra <...> thickly and confusedly punctured", "... about 30 spots in all on each elytron". I examined a photo of the holotype (TARI), the original description supplied with total figure of *Ch. laeviguttata* with the available specimens of *Ch. exanthematica exanthematica* from different parts of the area (including China) and found them to be conspecific. Some of the examined specimens from China have about 30 elytral smooth plates.

38. Abdullah, Qureshi (1969) described a new genus *Neopotanina* with new species *N. hamidi* from W Pakistan. Original descriptions of the genus and the species, together with the published photo of the holotype permit me to believe it to be conspecific with *Chrysolina exanthematica*. However, one character mentioned in the generic description, namely, anterior coxal cavities closed, differs from those in all *Chrysolina* members. I think, it is a mistake in the description of *Neopotanina*. Moseyko, Sprecher-Uebersax (2010) transferred *Neopotanina* and *N. hamidi* to *Chrysolina*, and Sprecher-Uebersax (2011) placed *Neopotanina hamidi* as a synonym of *Chrysolina exanthematica*.

39. Gebler (1830) proposed a new name *Chrysomela musiva* as a substitute name for *Ch. guttata* Gebler. The author supplied this new name with a description, indication on the type locality (Salair, Riddersk), and reference on the original description of *Ch. guttata* Gebler. Besides that, I found in ZMUH one specimen labeled (handwritten) by F. Gebler as "*Chrysomela musiva* n.sp." *Ch. musiva* can not be a new species! However, the name *musiva* should be considered as substitute name for *guttata* Gebler, and the type of *guttata* should be considered as a type of the substitute name, *musiva* (ICZN, 1999, 72.7).

Marseul (1887) separated *guttata* (= *musiva*) from *subaenea* (= *exanthematica*) on the base of the body shape, dorsal coloration, elytral puncturation and size of elytral smooth spots. I could not find any differences between these taxa in the body shape. Dorsal coloration varies in the both. However, I found some new distinguishing characters (See Key to subspecies of *Ch. exanthematica*).

Subspecific rank of ***musiva*** and ***gemmifera***

The most part of the material examined is presented in Fig. 8. Besides that, some single specimens (no more than 1–5 from each region) from Amur reg., N Urals, Tuva, Afghanistan, Vietnam, and E China (Shanghai) were also studied.

I found the specimens with elytra partly red (*gemmifera*) in the materials from Irkutsk reg., Transbaikalia, Mongolia, Amur reg., Yakutia, Polar Urals, and Tuva. Among the specimens from

Mongolia and Transbaikalia, the specimens with elytra partly red significantly prevails over entirely metallic ones (96% of partly red specimens for each of these regions). The ratio of color forms in other abovenamed territories can not be calculated because of the small number of specimens. In Mongolia and Transbaikalia, entirely metallic and bicolorous specimens do not occur in the same localities (Dubeshko, Medvedev, 1989, and material examined). In Mongolia, bicolorous specimens (*gemmifera*) inhabit steppe and steppe gravelly biotopes, xerophilic stony areas, but entirely metallic specimens (*exanthematica* s.str.) occur in wet meadows and forest edges (Dubeshko, Medvedev, 1989).

Therefore, I consider *gemmifera* to be a separate subspecies. According to Mayr (1971), the distinctive character in more than 75% of the specimens permits to separate a subspecies. Populations of *gemmifera* in Polar Urals and Yakutia are isolated from the main part of subspecific area. They are considered to be relict of Sarmatian icing, when tundra-steppe was predominant in E Siberia (Mikhailov, 2000b).

Having examined entirely metallic specimens (Fig. 8), I came to conclusion that specimens from two subdivisions of the specific area are distinctly differ from each other. These subdivisions are: "A": Altai, N-E Kazakhstan, E Kyrgyzstan, W Mongolia, and "B": Russian Far East, China, Japan. Specimens from area "A" are characteristic of the following features: 1) 5^{th} row of elytral smooth spots is absent or poorly developed in 94% of specimens, distinct in others, 2) elytral intervals are not narrower than diameter of punctures in 93% of specimens, 3) elytral intervals are flat and dull in 100% of specimens. On the other hand, the specimens from area "B" are characteristic of the inverse proportion. Therefore, I believe the populations from area "B" to represent the nominotypical subspecies and those from area "A" to represent a separate subspecies *musiva*.

Figure 8. Variability of *Ch. exanthematica.*

characters		Altai	Kras-nojar. Kr.	Irkut. Reg.	Mon-golia	Trans-baikal.	Yakut.	Khabar., Primorsk. Kr.	Korea	Japan	India, Nepal	Sichuan, Yunnan	N,N-E China
elytra: 5th row of smooth plates	absent	15		3	16	7							
	weak	50	3	4	55	26	8			3	1	2	4
	distinct	4	6	11	10	14	3	44	11	37	12	18	24
dorsal color	violet	6		1	1	1	6	6	1	1	3	1	
	bronze black	61	9	11	2	1	1	37	10	37	6	19	26
	bright green with black elytral plates	2						1		2	4		2
	elytra margined by red			2	48	37							
	elytra red with black plates			4	32	7	4						
elytral intervals	as wide as punctures or broader	63	3	1	31	9						1	
	narrower, than elytral punctures	5	6	17	53	36	11	44	11	40	13	19	28
elytral surface	flat, mat	68	1	2	41	26	5	3			8	4	1
	wrinkled, shining		8	16	43	19	6	41	11	40	5	16	27
number of specim.	females	41	4	8	48	26	5	22	5	26	6	12	21
	males	27	5	10	35	19	6	22	6	14	7	8	7

40. The color forms: *nigrogemmata* (rufous elytra with only sutural stripe and smooth spots dark) and *gemmifera* (= *guttifera*) (dark elytra margined with rufous basally and laterally) of the species *Ch. exanthematica* are rather disjunctive. However, I found two specimens of intermediate color form together with *nigrogemmata* and *gemmifera* among the specimens from Tuva. Besides that, I found the both, *nigrogemmata* and *gemmifera* in the same series of the specimens, e.g. from Asian Russia: Irkutsk and Nerchinsk, Mongolia: Nalaikha and Chelotai-buluk. Therefore, I believe *nigrogemmata* and *gemmifera* represent intra-populational variations (=aberrations).

41. Suffrian (1851) in the original description of *Chrysomela confusa* included bibliographical reference to "*Chr. Tagenii* Herrich-Sch. 157". Suffrian (1851) explained why he offered a new name *confusa* as follows: "In manchen Sammlungen befindet sich die vorliegende Art als *Chr. femoralis* Oliv., in andern unter dem Namen *Chr. Tagenii* Hoffmsegg. Von Letzterem ist jedoch niemals eine solche Art benannt werden, sondern vermuthlich jene Benennung dirch eine Corruption aus *Chr. Tagana* entstanden, welche Art aber von der vorliegenden gar sehr abweicht."

J.C. Hoffmannsegg (1766–1849) was the famous German botanist, entomologist, and ornithologist. He travelled in Hungary, Austria, Italy, France, Spain, and Portugal and collected a great entomological collection (deposited in MNHUB). The names "*tagenii*" by Herrich-Schaeffer (1839) and "*tagana*" by Suffrian (1851) were associated with the name of J.C. Hoffmannsegg. Obviously, the beetles from the collection by Hoffmannsegg with the names *tagana* in litteris and *tagenii* in litteris were used by Suffrian and Herrich-Shaeffer for the descriptions of *tagana* and *tagenii*, respectively. However, the original description of *Ch. tagenii* Herrich-Shaeffer (1839) includes the characters which differ from *Ch. tagana*, namely: "Schenkel rothbraun. Oberseite erzbraun", "Unten schwarzblau", and the total figure of this species (Herrich-Shaeffer, 1839: 157.9.b) shows short, narrow lateral furrows at pronotal base. All these characters permit me to consider *tagenii* to be close to *femoralis* rather than conspecific with *tagana*. One more difficult question is a type locality of *tagenii*. "Portugal", as mentioned by Herrich-Shaeffer (1839), seems to be incorrect because the species *femoralis* (which includes *tagenii* at subspecific rank) distributed in France and Spain only. Bechyné (1950a) reported subsp. *tagenii* from France and considered *confusa* as a junior synonym of *tagenii*. Obviously, it is incorrect.

42. *Ch. femoralis* var. *laeta* Weise, 1884a was originally reported from Austria (p. 373): "ich selbst besitze ein unzweifelhaft deutsches Stück aus den österreichischen Alpen, welches zur *Varietät c.* gehort" [it means var. *laeta*, p. 372]. Kippenberg (2010) considered *laeta* as synonym of the subspecies *varipes*. I am not sure if this is correct because *laeta* was described from Austria, and *varipes* – from France. If subspecies *laeta* is treated as valid one, the name *laeta* Weise, 1884a should be replaced with a new name because of homonymy with *laeta* Weise, 1882.

43. Provenance of the single type specimen of *Chrysolina lucidula* (China: Yunnan Province) given by Chen (1934) in the original description is incorrect. This species has never been found in China again. After examination of the holotype (Bieńkowski, 2008a) (*Melasomoptera* figures 7, 8), I concluded that it belongs to *Ch. lucida* (Olivier, 1807), a species distributed in southern Europe. Therefore, the geographical label of the holotype of *Ch. lucidula* is erroneous. By the way, one another species, described by Chen (1934) from "China" in the same work, *Plagiodera maculicollis*, was also mislabeled. Really, it is a synonym of *P. chilocoroidea* Stål, 1860 from S America (Columbia) (Daccordi, 2010).

The names *lucidula* Chen and *lucidala* Apfelbeck are not homonyms (ICZN, 1999, 58). The substitutional name *cheni* Bechyné is an available name (ICZN, 1999, 13.1.3), although no substitution was required.

44. Jacoby (1901) described *Polysticta confluens* var. *marshalii* and noted that Mr. Marshall collected the type specimens and sent them to the author. Therefore, I believe, M. Jacoby named this species in honour of Marshall. Therefore, *marshalii* is an incorrect original spelling (ICZN, 1999, 32.5). Weise (1916) correctly changed it to *marshalli.*

45. The subspecific name *occidentalis* Bechyné was originally used with the specific name *pura* Weise. However, Weise (1916) originally offered a new intrasubspecific name "ab. *pura*" as a replacement name for the invalid name *marshalli* Jacoby (junior homonym). Bechyné (1948a) was the first who used the name *pura* in the specific rank and described it. Therefore, *pura* is available name with the authorship by Bechyné (1948a). (ICZN, 1999, 45.5.1).

46. Weise (1882) under the name "*Chrysomela vernalis turca* Fairmaire" published diagnosis of the taxon which differs from the taxon described by Fairmaire, 1865 under the name *turca*. Therefore, the name *turca* Weise, 1882 is unavailable name because of incorrect identification. Later, Weise in: Heyden, Reitter, Weise (1906) offered a new replacement name *vernalis* ab. *ottomata* for *turca* Weise nec *turca* Fairmaire. However, the name *ottomana* Weise, 1906 is intrasubspecific one and therefore unavailable. Bechyné (1950a) was the first who used the name *ottomana* in the subspecific rank, namely as "*Ch. vernalis subsp. ottomana* Weise (*turca* Weise)". Therefore, the author of the available name *ottomana* is J. Bechyné. The specimens from "Constantinopel" and "Kodscha Balkan" which were studied and named by Weise (1882) as "*turca*" should be regarded as the type specimens for *ottomana* Bechyné (1950a) according to ICZN (1999, 72.4.2).

47. Daccordi (1982c) examined the syntype (male) of *Ch. metallica* deposited in NRS (*Centoptera* figure 7) and included this species in the subgenus *Ghesquiereita*. Specimens being at my disposal correspond to the redescription of *Ch. metallica* made by Daccordi (1982c). However, I follow Bechyné (1950a, 1952a) to consider this species as a member of the subgenus *Centoptera*. *Ch. metallica* differs from all other known members of the subgenus *Ghesquiereita* in body less convex, pronotum transversely slightly convex and bearing shallow, broad lateral impressions, and in strong basal fold of prothoracic hypomeron. On the other hand, all these characters permit me to include this species in the subgenus *Centoptera*.

48. The names *persica* Jakob and *iranica* L.Medvedev are both invalid because of secondary homonymy. Besides that, *persica* Jakob was suppressed as a junior synonym of the nominotypical subspecies of *armeniaca* Faldermann by Daccordi (1982b). On the other hand, all available specimens of *Ch. armeniaca* permit me to consider two geographic subspecies, corresponding to *armeniaca* s.str. on the one hand, and *iranica* (= *persica*) on the other hand. These two geographic subspecies are mostly allopatric, and the both taxa occur in S Azerbaijan only. They differ from each other in the dorsal coloration and elytral relief in the following way: 1) *armeniaca* s.str. : dorsum is blackish coppery with bronze reflection on head and pronotum, with stronger elytral punctures, elytra slightly wrinkled, 2) subspecies *iranica*: dorsum is blackish green olivaceous or blackish blue, with finer elytral punctures, elytra smooth, even, not wrinkled.

I examined: *armeniaca* s.str. from: Russia (Krasnodar Krai and Adygea) – 7 specimens, Russia (Stavropol Krai) – 2 spec., Abkhazia – 3 spec., Georgia – 1 spec., Azerbaijan – 3 spec.,

"Caucasus" (old label) – 3 spec.; and subsp. *iranica* from: Azerbaijan – 4 spec., Iran – 13 spec., Turkmenistan – 4 spec., Kyrgyzstan – 2 spec.

According to ICZN (1999, Supplement A, 3), I asked L.N. Medvedev to replace a junior homonym *iranica*. Type specimen of the new replacement name is a holotype of *iranica* (ICZN, 1999, 60A).

49. A new subgeneric name was differently published in the same article (Daccordi, 1978b): as "*Paradiachalcoida*" (on p. 745) and three times as "*Paradiachalcoidea*" (on p. 746 and 752). Later, Daccordi (1980b) used only one name, *Paradiachalcoidea*, as a valid one. Therefore, *Paradiachalcoida* is incorrect original spelling and unavailable (ICZN, 1999, 19.3, 24.2.4).

50. G. Jacobson published a joint description of the new subgenus *Pezocrosita* and new species *kuznetzowi* (1901a – Horae Russ. Ent. Soc.), and also he described a new species *sahlbergiana* in the combination with the subgeneric name *Pezocrosita* (1901b – Öfv. Finska Vet.-Soc. Förh.). Date of publication of the respective issue of Horae Russ. Ent. Soc. is 23.5.1901 new style, but the article by Jacobson was published as a preprint before this date. Preprints are accepted as published works in ICZN (1999, Glossary of terms). Preprint of the article by Jacobson was published in December, 1900 old style (= January 1901 new style) (Kerzhner, 1984). The article by Jacobson in Öfv. Finska Vet.-Soc. Förh. was considered at a meeting of the Finnish scientific community and approved for inclusion in the journal on 22.10.1900. The respective volume of Ofv. Finska Vet.-Soc. Förh. was published in 1901, the exact date is unknown. The volume was published not earlier than 22.5.1901, because in the volume itself there is a mention of new contributions to the library of the Finnish scientific community on the named date inclusive. However, I have an original separate of the article by Jacobson (1901b) which is a preprint (it carries a separate page numbering). Exact date of publication of this preprint is unknown. This date could be earlier than the entire volume. Thus, the question of the priority of the type species of the subgenus *Pezocrosita* remains open. I conditionally take the priority of the species published in Horae Russ. Ent. Soc. until the date of publication of the preprint of the article in Öfv. Finska Vet.-Soc. Förh. is known.

51. Original publication by Lopatin (1998) includes two different spellings of the same new specific name: *burchana* (p.829 and 835) and *burchanica* (p. 830, in the figure legend). Bieńkowski (2001) cited the both names and chose *burchana* to be valid one. Therefore, *burchanica* is a unavailable name (ICZN, 1999, 24.2.3).

52. The original description of *bowringii* was included in the first volume of "Journal of Entomology", which was printed in full in 1862. However, the article with the description of this species was included in the issue 2, which was separately printed in the October, 1860 (based on the date indicated on the issue). Date of printing of separate issue is accepted in ICZN (1999, Glossary of terms).Weise (1916) and Chen (1936a, b) agreed with the date 1860 as a date of the original publication of the name *bowringii*.

I have not a possibility to examine the type of *bowringii*. My interpretation of this widely distributed species is based on the original description (Baly, 1860) and several subsequent publications, namely: Kimoto, Gressitt (1981), Gressitt, Kimoto (1963), Chen (1935), 1936b). Quite different aedeagus for "*Chrysolina bowringi*" from Vietnam was pictured by Medvedev (1987). This figure differs even from aedeagi of the available specimens of *Ch. bowringii* from Vietnam.

Comments

Ch. stevensii was originally described from Myanmar (Baly, 1862). The original description of *stevensii* was included in the issue 55 of "The Annals and Magazine..." This issue was published in July 1862. I examined a syntype of *stevensii* (female) and a male from India, identified by S. Maulik as *stevensii*. Besides that, I examined the specimens of *bowringii* from N-E India, China, and Indochina. Therefore, I came to conclusion that the names *stevensii* and *bowringii* are conspecific.

The original description of *stevensii* includes a body length: 4 ⅔ lines (= 11.9 mm). A syntype being at my disposal is only 7.6 long.

53. Jacoby (1900) did not noted a number of *Ch. fulvoaenea* type specimens. Therefore, I regard a specimen labeled "Type H.T." as a syntype. I examined types of both, *Ch. fulvoaenea* and *Ch. madrasae* (*Pierryvettia* figures 38–47), compared them with the respective original descriptions (Fig. 9). I found the holotype of *Ch. madrasae* similar with the syntype of *Ch. fulvoaenea* in a number of characters (including aedeagus structure!) and differs only in body entirely dark bronze, pronotum with denser and more numerous large punctures (about 60) laterally and slightly denser and larger punctures at disc, and more sparse punctures in elytral rows: 14, 14, 9, 6 punctures in rows 4, 5, 6, and 7, respectively. However, the additional specimens being at my disposal (10 males, 15 females) show that above mentioned differences are attributable to the intraspecific variability.

Figure 9. Comparison of the characters in the original descriptions of both, *fulvoaenea* and *madrasae*, with the characters of the respective type specimens, observed by me.

characters	original description / type	*fulvoaenea*	*madrasae*
hind wings	original description	absent	developed
	type specimen	developed	
body coloration	original description	above obscure fulvous with aeneus gloss, below and legs fulvo-aeneous	aeneous
	type specimen	above obscure fulvous with aeneus gloss, below and legs fulvo-aeneous	aeneous
pronotal shape	original description	more than twice as broad as long	nearly three times broader than long
	type specimen	2.1 X	2.2 X
pronotal anterior angles	original description	rather obtuse	acute
	type specimen	obtuse	
pronotal puncturation	original description	disc with a few fine scattered punctures	disc very sparingly but rather strongly punctured
	type specimen	scattered moderately large punctures	denser, unevenly placed, slightly larger punctures
body shape	original description	elytra evenly moderately convex	elytra very convex, pointed posteriorly
	type specimen	elytra very convex, slightly pointed posteriorly	

54. I examined a collection by L. Redtenbacher (NHMW) and found there one specimen (female), supplied with the original author's label "*Perforata* Kaschmir Redt.". This specimen shares the recent interpretation of *separata* (Baly, 1860), including such features as: last maxillary palpomere is not narrower than penultimate one, 4th tarsomere bears two small denticles below apically, pronotum bears broad obsolete lateral impressions in basal ½, prothoracic hypomeron has basal fold. Therefore, I believe *perforata* Redtenbacher to be junior synonym of *separata* Baly. The name *Chrysolina* (incertae sedis) *redtenbacheri* Kippenberg, 2010 was offered to replace the junior homonym *perforata* Redtenbacher, nec Gebler. As a result, *redtenbacheri* is a synonym of *separata*.

55. Jacoby (1896) noted that *Ch. malayana* differs from *Ch. sumatrensis* "in the general coloration and puncturing of the same part" [elytra]. I compared syntype of *Ch. malayana* with the original description and additional specimen of *Ch. sumatrensis* and found that they differ only in the coloration of elytra: in *Ch. sumatrensis* elytra rufous with weak metallic reflection, in *Ch. malayana* elytra brown with bronze reflection. I think that it is intraspecific variation. Besides that, I compared the original description of *Ch. sumatrensis borneensis* Bechyné, 1950a with the syntype of *Ch. malayana* and found these taxa to be conspecific.

56. Motschulsky (1860a) had not mentioned a number of the type specimens in the original description of *Heliostola spectabilis*. I found two females labeled by V.I. Motschulsky as *Heliostola spectabilis* " in ZMMU (Motschulsky coll.). One of them bears a label "type" written by Motschulsky. Therefore, I designated this specimen as a lectotype.

Subspecies *polychroma* was originally described on the base of four specimens from the Sayans and 1 specimen from Mongolia, in which head, pronotum, and underside blue or violet, elytra purple with blackish discal stripe (this stripe is absent in the paratype of *polychroma* being at my disposal), with broad green stripes at suture and lateral margin; lateral impression of pronotum is shallower than in nominotypical subspecies and does not spread on anterior ½. I examined one type specimen. It is labeled as "holotype". However, it is really a paratype according to the information in the original publication (Medvedev, Korotyaev, 1975).

Subspecies *viridipurpurea* was originally described on the base of three specimens from Tuva, in which head and pronotum are green, sometimes with bluish reflection, underside green or greenish blue, elytra purple (with blackish discal stripe in the paratype of *viridipurpurea* being at my disposal), with broad green stripes at suture and lateral margin; lateral impression of pronotum is shallower than in nominotypical subspecies and does not spread on anterior ½ (shallow impression deepened basally and apically in the paratype of *viridipurpurea* being at my disposal).

In 53 specimens of *Ch. spectabilis* being at my disposal, color of head, pronotum, and underside, width of sutural stripe, presence (or absence) of lateral elytral stripe, and shape of pronotal lateral impression individually vary within wide limits and do not permit to separate geographical forms (Fig. 10). Therefore, I believe *polychroma* and *viridipurpurea* to be new junior synonyms of *spectabilis*.

Figure 10. Variability of *Ch. spectabilis* (number of specimens). Remark: some characters were examined not for all specimens.

characters		Krasnoyar. Krai	Tuva	Sayans	Mongolia	Transbaikalia	Khabarovsk Krai	Okhotsk Sea shore	Kamtschatka
head	violet	1		11	7			2	
	blue			6	4	1	1		
	bluish green	1	3	4	1	2	1		
	green		2	8	3	1	7	2	2
pronotum	violet	2		15	7			2	
	blue			7	2	3	1		
	bluish green		2	5	4	1	1		
	green		3	1	2		7	2	2
underside	violet			18	9	2		2	
	blue			4	2				
	bluish green	2	4	6	4	2		2	2
	green		1			1	9		
sutural stripe / scutellum	broader		5	15	8	2	2		
	similar			11	5		7	2	
	narrower	2		1				2	2
elytral lateral stripe	yes		5	28	15	4	7	2	
	no	2					2	2	2
elytral discal black stripe	yes	2	3	7		2	4		
	no		2	20	15	2	5	4	2
pronotal lateral impression in fore ½	no	1	2	7	1	1	7	3	
	yes	1	3	17	8	2	2	1	2

57. The explanation of the original understanding of the names *sylvatica* and *subcostata* is difficult because of the following reasons.

1) F. Gebler has not designated the type specimens of any species either in his collection, or in the publications. Type localities were often indicated by him approximately in the original publications.

2) specimens from Gebler's collection are usually supplied with only original label with specific name and without a date of determination. They are usually devoid of original geographic labels. F. Gebler has not separated type specimens from the others. Therefore, this author could add any specimens (from the type locality or any other territories) to his collection after the publication

of the original description of the respective species. On the other hand, some specimens from the original type series could be taken off, e.g. for exchange with colleagues.

3) Incorrectly identified specimens of the other species could be added to the original type series. One of such cases was found by Bourdonné (2007): the single specimen, labeled as "*Chr. undulata*" in the Gebler's collection in MNHN, does not correspond to the original description of the taxon in question.

4) F. Gebler has not examined male aedeagi and has not published any figures of the species. His descriptions are sometimes very detailed, however, did not include such diagnostic features as the shape of the last abdominal sternite, presence (or absence) of hind wings, etc.

5) The most part of the Gebler's collection is deposited in MNHN, however, the specimens with Gebler's original labels are also deposited in ZMMU and ZMUH. Silfverberg (1995) recorded that some types of the taxa described by F. Gebler are deposited in ZMUH. In practice, lectotypes and paralectotypes of the Gebler's taxa are designated not only in MNHN, but in ZIN (Bontems, 2001; Kabakov, 2006), ZMMU (Bieńkowski, 2007b). Moreover, Shilenkov (1996) writes that specimens from Gebler's collection in MNHN are least suitable for the finding of the types by this author because the curator of the collection, G. Deyrolle, deleted many original labels.

When the identification of the Gebler's taxa is necessary, I offer the following.
1) designate neotype, but not lectotype, when a holotype or syntypes can not be accurately identified, 2) use for neotype designation the specimen identified by Gebler or obtained from Gebler's collection, if such specimen exists, 3) these specimens should correspond to the respective original descriptions, or at least should not conflict with the original description, 4) should be fixed such interpretation of the Gebler's species which corresponds to the most common interpretation in the recent literature.

Two good species from the group *sylvatica-subcostata*, well distinguished from each other, occur in Altai (besides them there is another species, *arctoalpina*, extremely close to the former). *Ch. sylvatica* and *Ch. subcostata* well differ from each other in the male aedeagus and structure of the last abdominal sternite. These species also differ in degree of elevation of elytral ridges. These ridges are weak in the one, and strong in the other. Gebler (1848) separated *sylvatica* and *subcostata* on the base of the last character, namely, "Elytra <...> supra profunde punctato-striata, striis plus minusve sulcatis, <...>, interstitiis elevatis" and "Sie ist der *C. sylvatica* sehr ähnlich, <...> die Flügeldecken <...> Zwischenräune mehr oder veniger gerippt" in *Ch. subcostata*.

Chrysomela sylvatica was described on the base of the specimens from Salair Ridge and, possibly, from other places. The original description also includes one more specimen, differing from the type, collected at Tom' river, which, with doubt, belongs to another species. Bieńkowski (2007b) and Mikhailov (2006c) both designated lectotypes of *sylvatica* on the base of female specimens with weak elytral ridges from ZMUH and MNHN, respectively. The interpretation of *sylvatica* sensu Bieńkowski and Mikhailov corresponds to the original description by Gebler (1823).

Mikhailov (2006c) designated a male specimen with the original Gebler's label "*Chr: subcostata*" as a lectotype in MNHN. This specimen has weak elytral ridges. However, it does not mean that *sylvatica* and *subcostata* are conspecific. "Lectotype" of *Ch. subcostata* sensu Mikhailov deviates from the Gebler's original description of *Ch. subcostata* by the degree of elevation of the ridges on the elytra. I think, that the specimen in question belongs to *Ch. sylvatica*. It was incorrectly identified by Gebler as *Ch. subcostata*. On the other hand, I found a female specimen with strong elytral ridges in ZMUH. This specimen corresponds to the original description of *subcostata.* I designate this specimen as a neotype of *subcostata*. It bears the following original

labels: ♀ / Gebler / Sibiria occ. / Coll. Mannerh. and associates with bottom label *subcostata* (*Pleurosticha* figure 55).

58. The subspecies *Ch. tortuosa quangoensis* was originally mentioned as questionably proposed name in the following way: "?subsp. *quangoensis* nov." This name is available (ICZN, 1999, 11.5.1), because published originally before 1961.

59. Baly (1858) described from Ecuador a new species *Doryphora hebe*. Stål (1862) mentioned this taxon as *Chrysomela hebe*. Clark (1864) described *Polysticta hebe*, obviously, from S Africa. Vogel (1870) included *Polysticta* in the genus *Chrysomela* as a subgenus of the latter. He considered *hebe* Clark to be junior secondary homonym of *hebe* Baly and offered a new replacement name *lynx* for *hebe* Clark nec Baly. However, the name *lynx* was not used by anyone as a valid name after Vogel (1870), and the species *hebe* Baly was not considered as a member of the genus *Chrysomela* (Weise, 1916); presently, it is *Platyphora hebe* (Baly). Therefore, junior secondary homonym *hebe* Clark should be considered as a valid name (ICZN, 1999, 59.3).

60. New name *Chrysomela coccinelloides* Thunberg, 1787 was offered without a description but with the figure number 5 and reference to the figure 5. Therefore, it is available name (ICZN, 1999, 12.2.7).

61.New replacement name *mansueta* Daccordi, 1976c was offered because of the secondary homonymy: *Polysticta modesta* Clark, 1864 [Daccordi (1976c) considered *Polysticta* to be a subgenus of the genus *Chrysolina*] and *Chrysomela modesta* Fabricius, 1792 [Daccordi (1976c) considered *modesta* Fabricius to be valid name within the genus *Chrysolina*]. Later (Daccordi, 1976b) stated, that *modesta* Fabricius belongs to the genus *Eurypelta* (Eumolpinae). Therefore, *modesta* Clark and *modesta* Fabricius become the members of different genera. Daccordi (1976b) stated that *mansueta* is an invalid name and junior synonym of *modesta* Clark (ICZN, 1999, 59.4).

62. The famous scientist, Carl Peter Thunberg (1743–1828) originally described *Chrysomela superba* very briefly: "oblonga viridis, thorace lunula elytrisque lineis octo aureis" (Thunberg, 1787). This description includes neither information on the type locality and type specimens, nor figures. Since C.P. Thunberg had not indicated that the species was described by the single specimen, there is no reason to think that there was only one type specimen. The name *superba* was subsequently applied to the taxon, inhabiting E and S Africa (Weise, 1904, 1909, 1916; Achard, 1924, 1926a; Bechyné, 1950a, 1950b, 1953, 1955a; Daccordi, 1980b; Bieńkowski, 2001, 2007a). *Chrysomela superba* in this interpretation was designated as a type species of the subgenus *Chrysolina* (*Pseudotaeniochrysea* Daccordi, 1980b) from Africa (Daccordi, 1980b). Later, *Chrysolina* (*Pseudotaeniochrysea*) was treated as an African subgenus (Seeno, Wilcox, 1982; Daccordi, 1994; Bieńkowski, 2001, 2007a).

Ch. superba includes five valid subspecies (Bechyné, 1950b, 1953; Bieńkowski, 2001). The nominotypical subspecies *Ch. superba superba* is distributed in E Africa from Sudan (Nubia) to S Africa (Natal) (Weise, 1916).

Ge, *et al.* (2012) transferred *superba* from the genus *Chrysomela* auct. nec Linnaeus, 1758 (= *Chrysolina* Motschulsky, 1860a) to the Asian genus *Ambrostoma* Motschulsky, 1860a. This nomenclatural act was included in the "Abstract" of the paper by Ge, *et al.* (2012) only; any explanation of this decision is absent in the main content of the article. Information about the examined type specimens or any specimens from C.P. Thunberg's collection is also absent in this work. Only the legend to the figure 4 on p. 337 contains the following: "*Ambrostoma superbum*

(Thunberg), holotype". This conclusion about the "holotype" is incorrect, because holotype was not designated in the original publication (Thunberg, 1787; ICZN, 1999, 73.1.3). In this case, any original type specimen of *superba* should be considered to be a syntype (ICZN, 1999, 73.2; 73F). However, Ge, *et al*. (2012) did not provide evidence that the specimen examined by them belongs to the type series of *superba*, even if it comes from Thunberg's collection.

I also examined a specimen labeled "*superba*" in Thunberg's collection. This specimen is conspecific with *Ambrostoma quadriimpressa*. However, I have not evidence that this is a type specimen. A coloration of this specimens contradicts with the original description of *Ch. superba* (see "Comparison..." below). If this specimen really belongs to the type series, we should save the predominant usage of the name (ICZN, 1999, 82) and apply to the International Commission on Zoological Nomenclature in order to reject the existing name-bearing type (ICZN, 1999, 75.6).

Ge, *et al*. (2012) considered *superba* as a senior synonym of *Ambrostoma quadriimpressa* Motschulsky, 1845. However, the respective nomenclatural act ("new synonymy") is absent as such in this article by Ge, *et al*. (2012). I can find only indirect evidence of it. There is a list of species originally included by Motschulsky (1860a) in the genus *Ambrostoma*, with *quadriimpressa* among them in the "Introduction". But below, Ge, *et al.* (2012) have not used this name, and another name, *superbum* appeared instead of the name *quadriimpressa* without any explanation (Table 1, fig. 2, key to species).

A designation of the type species of the genus *Ambrostoma* by Ge, *et al*. (2012) as following: "*Chrysomela superbum* Thunberg, by subsequent designation" contains two mistakes. **(1)** Type species of the genus *Ambrostoma* was designated by Motschulsky (1860a) in the original publication as following: "type: *Ambr. 4–impressa* Ménétr."(p. 205), and below the author, Motschulsky included two more species in the genus *Ambrostoma*, namely *chinensis* Motschulsky, 1860a and *nepalensis* Motschulsky, 1860a (p. 228). Thus, the type species is a *quadriimpressa* by the original designation (ICZN, 1999, 68.2). Type species cannot be changed due to the fact that this name valid or invalid (ICZN, 1999, 67.1.2). **(2)** The type species *superbum* designated by Ge, *et al*. (2012) as a type of *Ambrostoma* does not belong to the species originally included by the author, Motschulsky (1860a) to this genus, and *quariimpressa* has not been formally suppressed as a synonym of *superbum* by Ge, *et al*., (2012). This action contradicts to ICZN (1999, 69.2.2).

Ambrostoma quadriimpressa is widespread in Asia (Mongolia, E Siberia, Russian Far East, Korea, N China) and it is a well-known species (Motschulsky, 1845; Jacobson, 1909; Chen, 1934, 1936a, b; Gressitt, Kimoto, 1963; Medvedev, Zaitsev, 1978; Medvedev, 1982, 1992a; Zaitsev, Medvedev, 2009; Warchałowski, 2010). This chrysomelid beetle is a serious forest pest in China, adults and larvae feed on leaves of *Ulmus pumila* (e.g., Li, *et al*., 2009). Type specimen of *Ambrostoma quadriimpressa* is deposited in the Motschulsky collection in ZMMU. *Ambrostoma quadriimpressa* is mentioned as a type of *Ambrostoma* in new Palaearctic Catalogue (Kippenberg, 2010). Cho, Borowiec (2013) write: "The *Ambrostoma* species has not been recorded in Korea since Chen (1936) mentioned *A. superbum* without any locality data and comments." However, it is incorrect: Chen (1936b) mentioned *A. quadriimpressum* but not *A. superbum*.

Because of the names *superba* and *quadriimpressa* are the type species of the subgenus *Chrysolina* (*Pseudotaeniochrysea*) and the genus *Ambrostoma*, respectively, the synonymy of *superba* and *quadriimpressa* violates the principle of stability of zoological nomenclature (ICZN, 1999, 23.2). Besides that, the usage of the name *A. superba* instead of the well-known *A. quadriimpressa* will complicate the search the literature on this forest pest, including the search in the Internet.

Therefore, I designate a neotype of *Chrysomela superba* to save the predominant usage of the name (ICZN, 1999, 75.1, 75.3) (*Taeniochrysea* figures 7, 8), and due to the inability to identify the

former name-bearing type (the type was not designated in the original publication, and Thunberg's collection (UUZM) contains another species under this name (fig. 4 in Ge, *et al*. 2012)). Neotype was selected from the range of the nominotypical subspecies *Ch. superba superba*, from Ethiopia, where this beetle is very common. Neotype will be sent to UUZM, in which the collection of the author of this species, C.P. Thunberg is deposited (Horn, Kahle, 1935–1937).

Diagnosis of *Chrysomela superba* Thunberg, 1787

Body elongate-oval, moderately convex in lateral view, entirely metallic, above green, head and pronotum with golden-red pattern, elytra with broad intervals between paired puncture rows golden-red (*Taeniochrysea* figure 7). Last maxillary palpomere oval, obliquely truncate, as broad as penultimate one. Pronotum with very shallow, obsolete lateral impressions, covered by large, dense punctures, disc covered by sparse, very fine punctures. Prothoracic hypomeron laterally with narrow impression covered by wrinkles. Anterior projection of metasternum immarginated at very tip. Elytra with paired regular rows of dense, moderately large punctures, intervals between puncture rows covered by sparse, very fine punctures. Elytral epipleura horizontal in apical ½ and invisible there in lateral view, with interior border bearing setae in apical ½. Hind wings well-developed. Pygidium without distinct longitudinal furrow in apical ½. Last abdominal sternite evenly convex. Tarsomeres 1–3 with entire sole, claw tarsomere without denticles. Hind tarsomere 1 as broad as apex of tibia. Aedeagus broadened at sides of apical opening, triangular at apex, but without distinct lateral denticles (*Taeniochrysea* figure 8). Body 6.8 mm long, 4.5 mm wide.

Neotype *Chrysomela superba*: male with labels: "E Ethiopia, Bale prov., Bale Mountains Nat. Park, ~ 1 km from Dinshu, h ~ 3180m, 19.XII.1995. leg. S. Kruskop", "NEOTYPE Chrysomela superba Thunberg, 1787. Bieńkowski design. 2015 [red]".

Comparison of the original description of *Chrysomela superba* with the specimen labeled as "*Ch. superba*" in Thunberg's collection, together with neotype of *Ch. superba* and specimens of *A. quadriimpressa*.

The neotype of *Chrysomela superba* is consistent with the original description. Thunberg (1787) wrote, that elytra bear 8 golden stripes. Each elytron of the neotype bears 4 broad well-marked regular golden-red stripes between the pairs of puncture rows, while narrow red stripe along the elytral epipleuron is hardly visible (*Taeniochrysea* figure 7). In contrast, color pattern on the elytron of the specimen labeled as "*superba*" in Thunberg's collection and available specimens of *Ambrostoma quadriimpressa* (*Taeniochrysea* figure 6) consists of purple (not golden!) irregular spots but not 4 distinct stripes, because of longitudinal purple stripes are connected with each other by transverse bands at elytral base, before and behind transverse elytral impression, and inner longitudinal stripes present in elytral apical part only and connected with each other anteriorly and posteriorly.

63. Daccordi (1994) included *Liomela* in the genus *Chrysolina* at the subgeneric rank. Therefore, *Liomela relucens* Daccordi should be replaced because of the secondary homonymy with *Chrysolina relucens* (Rosenhauer). ICZN (1999, Supplement A. 3) recommends to ask the author of the junior homonym to publish a replacement name.

64. Incorrect original spelling of the specific name "*Sjöstedti*" was corrected to *sjostedti* but not *sjoestedti*, in respect that surname Sjöstedt, from which it was originated, is Swedish, not German (ICZN, 1999, 32.5.2.1).

65. A new replacement name *onychina* was offered in connection with the fact that the author considered the name *fragariae* incorrect (Wollaston, 1860). Firstly, Wollaston (1854) believed that the species feeds on *Fragaria*, and then he found that this beetle does not develop on this plant (Wollaston, 1860). Such replacement is not necessary. However, *onychina* is an available name (ICZN, 1999, 12.2.3).

66. I compared the type specimens of *chalcea* and *bienkowskii* (*Semenowia* figures 1, 7) together with the original descriptions of both taxa, and came to conclusion that these taxa to be conspecific (Bieńkowski, 2008c, 2013).

67. The original description of *Chrysomela montana* Gebler, 1848 does not include the information on the number of the type specimens and exact type locality. The author, F. Gebler, included this description in the article devoted to the beetles from "Kolywano-Woskresenskischen Hüttenbezirke Süd-West Sibiriens". This region approximately corresponds to whole modern Altai Krai. F. Gebler noted in the original description: "*C. montana* Man." and "Comes Mannerheim in lit." , because he received the type material from C.G. Mannerheim. Moreover, F. Gebler indicated C.G. Mannerheim to be the author of the taxon in question. I found in Mannerheim's collection (ZMUH) the respective specimens, labeled "*montana*", "Mont. Kusnetsk.", "Gebler" (male and female) and "Kolyvan.", "Gebler" (male). Having all the grounds, to consider them as syntypes, I designated a male from the former locality as lectotype (*Sibiriella* figures 24–26**)**, others – as paralectotypes (Bieńkowski, 2005). This lectotype corresponds to common use of the name *Ch. montana* in taxonomical literature (Jacobson, 1925; Kontkanen, 1957b; Medvedev, Dubeshko, 1992; Mikhailov, 2000; Bieńkowski, 2005, 2011).

Contrary to this my designation (Bieńkowski, 2005), Bourdonné (2007) designated another specimen from MNHN as lectotype of *montana*. Bourdonné (2007) chose a male with the single original Gebler's label "*Chr: montana*" without any other labels, including geographic ones, or labels indicating that this beetle was obtained from Mannerheim (it is important for this case, see above!), or labels indicating that this specimen was examined by Gebler when he described *montana*. The specimen found by J.-C. Bourdonné is conspecific with another species, namely *Ch. schewyrewi*, and contradicts to common use of the name *montana* (see above). Yu.E. Mikhailov's statement (Mikhailov, 2009), that the official place of deposition of Gebler's collection is not ZMUH (Helsinki), but MNHN (Paris), with the reference to Horn, et al., (1990), is incorrect. A publication by Horn, et al., (1990) has no legal, or nomenclature, or taxonomic force, and serves only to facilitate the search for type specimens. Moreover, a practice of taxonomists is such that type specimens from the Gebler's collection are found (and designated as lectotypes and paralectotypes) not only in the MNHN, but also in the collections of ZIN, ZMMU, ZMUH (see comment 57).

In case of *Ch. montana*, this takes on special significance, because a specimen deposited in MNHN contradicts the prevailing recent understanding of this taxon (Jacobson, 1925; Kontkanen, 1957b; Medvedev, Dubeshko, 1992; Mikhailov, 2000; Bieńkowski, 2005, 2011). Thus, it should be considered the designation of the lectotype of *Ch. montana* by Bourdonné (2007) to be invalid because:1) it is not proved that this specimen belongs to syntypes (ICZN, 1999, 74.2), 2) such designation of lectotype contradicts the principle of stability of the zoological nomenclature (ICZN 1999, 23.2). Even if the specimen found in the MNHN belonged to type specimens, and other typical specimens were not found, then Bourdonné should have maintained the predominant use of the name *montana* and designate the neotype (ICZN, 1999, 75.6).

68. The type locality of *Ch. substrangulata* – "Hongrie" can not be associated with Hungary (as the author of the species, Bourdonné (1986), supposed). This species was never found again in Europe. On the other hand, I found in different European museums some non-European leaf-beetle species with the same label "Hongrie". Perhaps this error with the labels had one source. E.g., one specimen of Asian species *Ch. aeruginosa* in ZIN (coll. Artobolevsky) is arranged with such label "Hongrie".

69. Bourdonné (2007) designated a specimen bearing the original Falderman's label (type locality: Irkutsk and collector: D. Stchukin) and corresponding to the original description of *Ch. gibbipennis*, as a holotype (MNHN). This specimen is a female. However, this taxon belongs to the group of three species (*Ch. dudkoi, Ch. kholsunica, Ch. schewyrewi*) in which the precise identification is possible on the base of male specimen only (Bieńkowski, 2005). *Ch. kholsunica* is known from W Altai only, *Ch. dudkoi* occurs mostly in W Altai, the area of *Ch. schewyrewi* includes Altai, Sayans (eastward to Kryzhina Ridge), and Central Siberian Plateau. On the other hand, none of them are known from the typical area of *Ch. gibbipennis* (Irkutsk) (Mikhailov, 2009). Therefore, it is impossible to associate the name *gibbipennis* with any of three above named species. I propose to consider *gibbipennis* as a taxon of uncertain position within the subgenus *Sibiriella*, and use *schewyrewi* as a valid name. Lectotype of *Ch. schewyrewi*, male, was designated by me (Bieńkowski, 2005) (*Sibiriella* figure 36).

The original description of *Ch. gibbipennis* does not include the information on the number of type specimens. Therefore, the designation of "holotype" (Bourdonné, 2007) is incorrect (ICZN, 1999, 73.1.2, 73.1.3). This specimen should be considered to be a syntype, but not lectotype because the article by Bourdonné (2007) was published after 1999 (ICZN, 1999, 73F; 74.6).

70. The name var. *pratensis* was originally published by Weise (1884a) together with the diagnosis and bibliographic reference to *Ch. hyperici* Degeer, 1775. The last name is incorrect subsequent identification; it is unavailable name by itself (ICZN, 1999, 49), but the name *pratensis* is available. Type specimen of the name *pratensis* is a specimen which was incorrectly identified by Degeer (1775) as *hyperici* (ICZN, 1999, 72.4.2). Type locality of *hyperici* Degeer, 1775 was not originally indicated.

71. Helliesen (1912) in the original description of *kuesteri* mentioned that this new name is proposed for the taxon which was incorrectly identified by Küster (1845) as *sanguinolenta*. The name *kuesteri* Helliesen is not a replacement name because the name *sanguinolenta* Küster is unavailable name (ICZN, 1999, 49). However, the specimens erroneously identified by Küster as "*sanguinolenta*" should be included in the type series of *kuesteri* (ICZN, 1999, 72.4.2). Helliesen (1912) has not designated a holotype of *kuesteri*. Therefore, all specimens used by Helliesen for the original description of *kuesteri*, together with all specimens identified by Küster as "*sanguinolenta*" belongs to the series of syntypes of *kuesteri*.

72. *Ch. grossepunctata* was reduced to subspecies of *Ch. gypsophilae* by Franz (1965). I examined 76 specimens which I identified as *Ch. lucidicollis grossepunctata* from Canary Isls., including 5 syntypes of *grossepunctata*, holotype and paratype of *grancanariensis* (both are females). I think, *grancanariensis* to represent a rare color variation (without blue shine), but not a separate species. Such character of *grancanariensis*, mentioned in the original description (Lindberg, 1953), as relief of dorsal side, is within the limits of individual variability.

73. The original description of *Chrysomela rufomarginata* is usually attributed to Suffrian (1851) (e.g., Weise, 1916; Warchałowski, 1993, 2003). However, Suffrian (1851) himself wrote the following: "*Sturm* verbindet die Normalform [*gypsophilae*, my remark] gleichfalls mit *Chr. sanguinolenta*, während er ein abnorm gefärbtes Stück, bei welchem der gelbrothe Rand sich soweit ausdehnt, dass er fast die halbe Breite der Deckschilde einnimmt, als *Chr. rufomarginata* aufführt." I have not succeeded in finding the mentioned work by J. Sturm. Suffrian (1851) also speaks of the specimens of the same taxon obtained from Sicily under the name "*Chr. Marginepunctata* Géné", but this name is *nomen nudum*.

74. The name *rossia* was originally proposed by Illiger (1802) without a description, but with reference to the incorrect identification "*sanguinolenta*" by Panzer (1794: 16 Hf., N 10). The name *sanguinolenta* Panzer is unavailable (ICZN, 1999, 49), and the name *rossia* Illiger is available (ICZN, 1999, 12.2.1). Type specimens (syntypes) of *rossia* are those examined by Panzer (1794) and Illiger (1802).

The name "*C. Rossia*" (in the original spelling) looks like it formed from the surname Rossi. But Illiger (1802) did not specify this definitely. Suffrian (1851) changes the ending of the name to "*Rossii*", as formed from the surname. However, it is an unjustified emendation.

75. The name *Chrysomela melanostigma* presents in the catalogues by Chevrolat (1833: 401, 1837: 425) as "*melanostigma* Kollar" in the synonymy of *sicula* Dejean. However, this name is given without description, figure, or reference. Therefore, it is *nomen nudum*.

Hemminger, Harold (1874) and Weise (1916) attributed the name *melanostigma* to Herrich-Schaeffer (1838) as a valid species and to Herrich-Schaeffer (1839) as a synonym. However, I have not found "*Chrysomela melanostigma*" in the work by Herrich-Schaeffer (1838). Moreover, Herrich-Schaeffer himself does not include *Chrysomela melanostigma* in his catalogue (Herrich-Schaeffer, 1840), although he mentions all the new species described by him before (Herrich-Schaeffer, 1838, 1839), namely: *tagenii, Dahlii, Herii, florea, incerta, peregrina,* and *meridionalis*. Thus, whether the original description of *Chrysomela melanostigma* was or not, the question is open.

76. *Chrysomela Sparshalli* was originally described from England (Stephens, 1835). Even for a short diagnosis in this work, one can conclude that *sparshalli* is a synonym of mediterranean species *Ch variolosa*. It was probably introduced to England by people, but disappeared afterwards, just as *Lilioceris lilii* came to the United Kingdom in the 19th century and formed the short-lived populations (Majka, LeSage, 2008).

77. The taxon *Chrysolina oceanoripensis* was proposed earlier, than it was described under the present name (Bourdonné, Doguet, Petitpierre, 2013), with unavailable names (*nomina nuda*) such as "*Chrysolina* (*Stichoptera*) *gypsophilae ripoceanensis* Bourdonné" (Bourdonné, Doguet, 1991) and "*Chrysolina* (*Stichoptera*) *ripoceanensis* Bourdonné, Doguet" (Petitpierre, 1999).

78. The original description of *Chrysomela scovitzii* is very brief: "Ovata, valde convexa, aeruginoso-micans; elytris profunde seriatim punctatis; corpore subtus brunneo, chalybaeo-micante". A number of the type specimens was not originally indicated. According to Horn, Kahle (1935–1937), the Caucasian beetles from E. Ménétriés collection were deposited in ZIN. However, I could not find *Ch. scovitzii* there. On the other hand, I found in ZMUH (Mannerheim coll.) one male which, according to labels, was sent by E. Ménétriés to C. Mannerheim and probably belongs to the syntypes of *Ch. scovitzii*. This specimen is bronze, with elytra brown with bronze reflection,

punctures arranged in equidistant regular rows; pronotum rounded laterally, with deep, smooth lateral grooves along entire length, and disc dull, minutely punctate; and with aedeagus identical to that in *Ch. chalcites* (Germar, 1823). Therefore, I consider *Ch. scovitzii* to be a junior synonym of *Ch. chalcites*. Weise (1916) suppressed *Ch. scovitzii* (writing a name with an error: "*scovitzi*") as a synonym of *Ch. bicolor* despite the fact that the former was originally described from Azerbaijan, and the latter does not occur in the Caucasus.

79. The name *Chrysomela resplendens* Suffrian, 1855 was proposed to replace unavailable name (incorrectly identified, ICZN, 1999, 49) *Chrysomela ignita* Suffrian, 1851. Type locality of *ignita* ("Auf Sicilien") should be regarded as type locality of *resplendens* (ICZN, 1999, 72.4.2).

80. The type locality of *Chrysomela americana* Linnaeus, 1758, namely "America", is traditionally considered to be erroneous, but it can indicate the introduction (uninhabited) of this European species to America. On the other hand, Linnaeus (1767) indicated another, more reliable type locality: "Barbaria", that is, N Africa.

81. Specimens from both, Corsica Isl. (described as subspecies *ubertini*) and Elbe Isl. (described as subspecies *insulivagans*), sharply differ from other *Ch. americana* specimens from different parts of Europe and N Africa. This difference is visible even without magnification. In the most specimens from Corsica and Elbe Isls., upper side of body is mostly blue or purple. In many specimens from the Elbe Isl. elytra have green and even golden tinge. They do not have such contrasting elytral bands as the specimens of *Ch. americana* from other territories. Specimens from Corsica and Elbe Isls. weakly differ from the specimens from other territories is convex 8th and 10th elytral intervals and narrow, impressed 9th interval. In *Ch. americana* from other localities, the 8th interval can be flat or convex.

According to the original description, subspecies *insulivagans* differs from *ubertini* by much smaller elytral punctures and smaller body length (hardly longer than 7 mm, while 7.5–8.5 mm in the compared subspecies). I studied 6 males and 9 females from Elbe: males are 6.4–7.0 mm long (average 6.8 mm) and females 7.2–8.3 mm long (average 7.6 mm), and 6 males and 9 females from Corsica: males 6.6–7.7 mm long (average 7.3 mm) and females 7.5–8.3 mm (average 8.0 mm), respectively. There is a difference in body length, but insignificant and insufficient to separate subspecies (less than 75% of different individuals). Differences in puncture and other differences are not observed in the specimens from Elbe and Corsica. Thus, I came to conclusion that *Chrysolina americana ubertini* (=*insulivagans*).

Subspecies *ubertini* also inhabits the coast of the Ligurian Sea. I studied 5 specimens from environs of Genoa. Three of them correspond to subspecies *ubertini*. They are violet from above, with elytral punctures surrounded by a golden. In the 4th specimen, broad elytral intervals are bluish-green, and narrow intervals are violet (intermediate coloration between subspecies *ubertini* and s.str.). Only last, 5th specimen has broad elytral intervals purple-golden, and narrow intervals green and corresponds to the subsp. *americana* s.str.

On the other hand, in Corsica Isl., specimens are occasionally found that correspond in color to the nominative subspecies. In NMB, I found 8 specimens from Corsica Isl. Seven of them have characteristic colors of subspecies *ubertini* and the one specimen has a colors of subsp. *americana* s.str. This does not contradict the interpretation of the population from Corsica and Elbe as a separate subspecies.

82. Bechyné (1952a) used the name "subsp. *lineata* Papp." for the taxon, which was originally described as *Chrysomela* (*Colaphosoma*) *lurida* ab. *lineata* Papp, 1946. The name *lineata* Papp was originally intrasubspecific and therefore unavailable. In fact, Bechyné (1952a) established new name *lineata* Bechyné, 1952a (ICZN, 1999, 45.5.1).

Bourdonné (2008) proposed a new substitute name *pappi*, as he himself writes, for "*Chrysomela pseudolurida lineata* Papp, 1946" nec "*Chrysomela lineata* Marsham, 1808". By this action Bourdonné (2008) allowed 4 nomenclatural mistakes. Firstly, the original trinomen "*Chrysomela pseudolurida lineata"* does not exist, because Papp (1946) proposed new name *lineata* in the combination with specific name *lurida*. Secondly, the name *lineata* Papp was originally proposed as intrasubspecific, therefore unavailable, and substitution was not required. Thirdly, substitution was not required, since the species *Notoclea lineata* Marsham, 1808, transferred to *Paropsis lineata* (in Erichson, 1842; Blackburn, 1898) and then to *Paropsisterna lineata* (in Weise, 1916) was never used in the combination with the generic name *Chrysomela* or *Chrysolina*. Fourthly, even if such substitution was required (because of secondary homonymy), then Bourdonné (2008) still should not have given a substitute name, since he simultaneously transferred the taxon in question to the genus *Craspeda* (ICZN, 1999, 59.2). However, the name *pappi* is available name (ICZN, 1999, 10.6).

83. New name *obenbergeriana* Bechyné, 1958 was offered to replace *Chrysolina obenbergeri* Bechyné, 1950a because of integration of the genera *Chrysolina* and *Oreina*. There was name *obenbergeri* Marchand, 1939 in the genus *Oreina*. Since at present *Chrysolina* and *Oreina* are considered as two separate genera, the name *obenbergeriana* Bechyné, 1958 is not used, but *obenbergeri* Bechyné, 1950a is used (Warchałowski, 1993, 2003; Kippenberg, 2010). Junior secondary homonym *obenbergeri* Bechyné, 1950a should not be rejected because of substitution (ICZN, 1999, 59.3).

84. Kocher (1958) indicated in the original description of *tangeriana*, that he proposed this name for the taxon, erroneously identified as *tortipennis* by Peyerimhoff (1938) (nec Fairmaire, 1865). Therefore, *tangeriana* Kocher, 1958 is not replacement name, because *tortipennis* Peyerimhoff is unavailable one (ICZN, 1999, 49). However, the specimen(s) erroneously identified by Peyerimhoff (1938) should be included in the type series of *tangeriana* (ICZN, 1999, 72.4.2). Kocher, 1958 has not designated a holotype. Therefore, all his specimens, together with the specimens of "*tortipennis* Peyerimhoff", are syntypes.

Peyerimhoff (1938) has not indicated exact localities, from which he obtained his "*tortipennis*". Kocher (1958) notes that *tangeriana* occurs in Tanger (the northern coast of Morocco), considers this species to be close to *Ch. afra*, without clearly indicating any differences between them. *Ch. afra* is described from Algeria. I examined the syntype of *afra*. This species is recently recorded from Algeria, Tunisia, and Morocco (Warchałowski, 2003). Comparing the original description of *tangeriana* with the syntype of *afra*, I found them belonging to one taxon.

I have only 5 specimens of *afra maritima*. It is not sufficient to study the taxonomical position of the subspecies.

85. I examined holotype (female) of *extricata* Bechyné, 1950a, together with topotype (female) and one more specimen (female) identified by the author, Bechyné, as *extricata*. This taxon is 13.9 mm long, 9.9 mm width, black, dull, with pronotal lateral callus separated from the disc by deep impression filled with large punctures and wrinkled intervals in basal ⅓ and by very weak sloping

impression with 20 large punctures in apical ⅔, elytra with large irregular punctures and wrinkled intervals, legs metallic blue, with femora and tibiae shine through red.

I compared available specimens of *extricata* with the original description of *solata* and found them to be conspecific.

Having compared the original descriptions of both, *scorodon* and *solata* (both are described from Algeria), I came to conclusion that they are conspecific. They were described almost simultaneously. S. Marseul, the author of the junior synonym, *scorodon*, does not compare his new taxon with *solata* (the latter was not known to him), but only with *afra.*

86. Having examined a syntype of *krishnu* (*Timarcholina* figures 26–30), I came to conclusion that it is a member of the subgenus *Timarcholina* (see characters in "Review of the subgenera...").

87. *Ch. nagaja* and *Ch. daccordii* belong to species group which is morphologically rather close to the subgenus *Timarcholina* and differs in smaller body size and absence of the denticles on 4th tarsomere (*Ch.* (*nagaja*) species group figures 1–9).

88. Bourdonné (2005, 2008) included *Ch dohrnii* in the subgenus "*Craspeda*" (together with *Ch. limbata* and *Ch. jenisseiensis*), i.e. *Zeugotaenia*. However, a number of characters permits me to consider *Ch. dohrnii* as a member of the subgenus *Diachalcoidea* rather than *Zeugotaenia* (see Differential diagnosis of the subgenus *Diachalcoidea* in "Review of the subgenera...").

89. Medvedev, Okhrimenko (1991) recorded *Ch. jenisseiensis* from a single location in European Russia, namely Tambov city. This record is based on the single male (examined by me in MC) with label "Тамбов 17 VII 23". I think this label to be erroneous, because: 1) I studied more than 1500 specimens of *Ch. limbata*, including 282 specimens from European Russia, and more 200 specimens of *Ch. jenisseiensis*. I have not found any other specimen of *Ch. jenisseiensis* from European Russia (except S Urals); 2) I found one specimen of *Ch. jenisseiensis* with the label: "Дагестан Аварск 17 VI 40". This label was wrote with the same hand, on a sheet of the same size and on exactly the same paper as "Тамбов 17 VII 23". Thus, the "Tambov" label was made much later than 1923, and possibly not by the collector.

90. I examined one male of *Ch. furva* (*Upseleatlasia* figure 1) and the respective original description (Peyerimhoff, 1926). According to the original description, elytra with unclear pale lateral stripe, with puncture rows, which are furrow-shaped laterally and apically, and with smooth intervals, covered with hardly visible punctures. Based on these characters, it is possible to consider *furva* to be close to *villiersi*.

91. I examined a paratype of *Ch. bechynei* (female). It is externally similar with *Ch. seriepunctata*. I think, these names are conspecific. In particular, the paratype of *bechynei* shares the following features of *seriepunctata* as: apex of the last abdominal sternite is broadly truncate and depressed medially, margined with furrow; tarsi are narrow, with entire sole.

92. *Chrysomela nigrita* was originally described by Fabricius (1792) with the reference to Geoffroy (1762): "C[hrysomela] ovata cyanea elytris punctatis obscurioribus. Chrysomela coerulea thorace violaceo. Geoffr. Ins. I. 259. 6.α.
Habitat Parisiis Mus. Dom. Bosc.
Statura omnino *C. Goettingensis*. Antennae fuscae. Caput & thorax glabra, laevia, nitida, cyanea.
Elytra vage punctata, multo obscuriora. Corpus cum pedibus cyaneum spongiis totis cinereis."

Comments

The specific names, proposed in the work by Geoffroy (1762) are suppressed (The Bulletin of Zoological Nomenclature, 1994). However, *Chrysomela nigrita* Fabricius is an available name.

93. Lectotype and 4 paralectotypes of *Ch. tundralis* were designated by me (Bieńkowski, 2004b). Type specimens of *Ch. kuznetzowi* and *Ch. poretzkyi* were considered lost for a long time (Mikhailov, 2006a, 2008, Bieńkowski, 2004b, 2007b). Recently they were found in the private collection of late I.K. Lopatin and returned to ZIN. I examined holotype (female) of *poretzkyi* and one of two syntypes (both are females) of *kuznetzowi*.

According to the original descriptions of both (Jacobson, 1897), *poretzkyi* and *kuznetzowi*, these taxa are very similar to each other and differ as follows (Fig. 11).

Figure 11. Distinguishing characters of *poretzkyi* and *kuznetzowi* after Jacobson (1897).

characters	*poretzkyi*	*kuznetzowi*
pronotal lateral calli anteriorly	rather narrow	more narrow, than in *poretzkyi*
scutellum	impunctate	finely punctate
elytra	broadened from base to apical ⅓	weakly broadened posteriorly
abdominal sternites	strongly punctate	finely and sparsely punctate
1st abdominal sternite basally	densely wrinkled	without wrinkles
1st tarsomere below	with narrow, abbreviated glabrous stripe basally	without glabrous stripe
body length (mm)	7.5	7.0
body width (mm)	5.7	5.3

I examined a number of specimens from the specific group *tundralis-poretzkyi-kuznetzowi* from European Russia (the North and Lipetsk reg.), Urals, and Siberia and came to conclusion that *tundralis*, *poretzkyi*, and *kuznetzowi* are conspecific. Differences of the type specimens of *poretzkyi* and *kuznetzowi* are within the individual variability.

Before (Bieńkowski, 2007b), I paid attention on the body proportion of the type specimen of *poretzkyi*, mentioned by Jacobson (1897). Such proportion is atypical of *Chrysolina* member, its width is rather large out of its length. I suggested that the type of *poretzkyi* may be an abnormal, monstrous specimen. The study of the holotype showed that this is a normal specimen. However, the author (Jacobson, 1897) made a measurement error.

94. *Camerounia* with single species *C. ornata* was excluded from *Chrysolina* by Bieńkowski (2007a). I found *C. ornata* to differ from the species of the subgenus *Chrysolina* (*Polystictella*) in the elytral epipleura inclined outside, pronotum emarginate laterally before posterior angles, and metasternum immarginated anteriorly between mid-coxae. Furthermore, *C. ornata* is more close to the genus *Sphaerolina* from India than to any other subgenera of *Chrysolina* because of body very convex, hemispherical in lateral view, pronotum cordate, metasternum immarginated anteriorly between mid-coxae, antennomeres 7–11 broadened and depressed, and eyes narrow, vertical. See also "Key to genera of the subtribe Chrysolinina" and "Supplement. Genus *Camerounia* Jolivet, 1949".

95. After Bieńkowski (2001), the genus *Timarchomima* was found to be monotypic, including *T. indica* (Jacoby, 1893). Then, I transferred (Bieńkowski, 2007a) *Chrysolina* (*Timarcholina*) *longicornis* Maulik, 1926 the genus *Timarchomima* on the base of metathorax anteriorly marginated, except the middle, and elytral punctures entirely confused. See also "Supplement. Genus *Timarchomima* Bechyné, 1950".

96. I examined the specimens of the both, *plagioderoides* (Vogel, 1870) and *transvalense* (Jacoby, 1901) which correspond to the respective original descriptions and found them to belong to the genus *Ageniosa* Weise, 1908 because of elytral epipleura devoid of setae, sutural furrow absent, body hemispherical, pronotum very convex, without a spur of lateral impression, with anterior and posterior corners rounded.

97. The name "*viridisplendens*" was firstly offered by Bechyné, 1950a at the intrasubspecific rank (aberration). However, *viridisplendens* Bechyné, 1950a was erroneously cited by Kippenberg (2010) as an available name. Really, *viridisplendens* became available name after Bechyné (1958), who firstly used it at the subspecific rank (ICZN, 1999, 10.2, 45.5.1).

98. According to Kerzhner (1984), the following dates of the publication of volume 29 of Horae Soc. ent. ross., Issue 3–4 (including pages 529–558 with Jacobson's paper) should be accepted. Year 1895 is indicated on the cover of the volume. When recalculating to a new style, the date of publication of Issue 3–4 is January, 1, 1896. But separate reprints to this issue were published earlier, so the release date is December1895, not 1896, as Kippenberg (2010) points out. This refers to the new taxa described by G. Jacobson, namely: *Chrysomela schewyrewi, Ch. sculpturata, Ch. tibialis, Ch. amplicollis, Ch. roborowskii, Ch. fallax, Ch. przewalskii, Ch. lia, Ch. koenigi, Ch. obovata, Ch. marginata* var. *purini, Ch. polita* var. *epipleuralis*.

99. The name *Chrysomela J.Danieli* Roubal, 1912 is incorrect original spelling. It should be corrected to *jdanieli* (ICZN, 1999, 32.5.2.4.4., example, 32.5.2.5), but not *danieli*, as cited by Weise (1916), Bieńkowski (2001), Kippenberg (2010).

100. The single specimen of *lineolata* known till now, the holotype (female) represents, in my opinion, a color variation of *marshalli* with orange coloration more developed than in holotype of the latter.

101. "*Chrysomela vernalis* Forster, 1771: 23 (Nov. spec. Ins. 1)" does not exist, despite the fact that this reference is cited by Weise (1916) and Warchałowski (1994) as a synonym of *Gonioctena olivacea* (Forster, 1771), and by Kippenberg (2010) as a synonym of *Chrysolina vernalis* (Brullé, 1832).

In fact, the name *Chrysomela vernalis*, supplied with a description ("Chr. nigra, capite, thorace, elytris pedibusque olivaceis, elytris stria longitudinali et sutura nigra") and reference ("Forst. nov. ins. gen. p. 23. n. 23") first appears in Gmelin (1790), p. 1689. Thus, J.G. Gmelin proposed a new name for the taxon, which was described by Forster (1771) under the name *olivacea*. Therefore, Gmelin (1790) is the author of the name *vernalis*. The name *Chrysomela vernalis* Gmelin, 1790 is a primary senior homonym of the name *Chrysomela vernalis* Brullé, 1832. According to ICZN (1999, 23.9), *Chrysomela vernalis* Brullé, 1832 should be considered as a valid name. After Gmelin (1790), noone used *Chrysomela vernalis* Gmelin, 1790 as a valid name, as I know (ICZN, 1999, 23.9.1.1.). *Ch. vernalis* Brullé, 1832 was used as a valid name in 25 publications for the last 50 years. These publications are cited by Kippenberg (2010), p. 72–73,

according to ICZN (1999, 23.9.1.2.). Therefore, *Chrysomela vernalis* Brullé, 1832 is *nomen protectum*.

102. Kippenberg (2010) considered *Chrysomela postviolacea* Marseul, 1887 to be a synonym of *Ch. stachydis*. I am not sure of the correctness of this synonymy. *Ch. stachydis* is known to be an endemic of the Sardinia and Corsica Isls. *Ch. postviolacea* was described from Algeria.

Besides that, Kippenberg (2010) in the list "genus *Chrysolina* nomina dubia" cited *Chrysolina postviolacea* Bechyné, 1950a: 94 (Canary Islands). However, Bechyné (1950a) has not described such taxon, he only cited the name "*Chr. postviolacea* Woll." But, as I know, T.V. Wollaston has not described a taxon under this name. Thus, *Chrysolina postviolacea* Bechyné, 1950a is *nomen nudum*.

103. *Ch. oricalcia* is an European species spread to the east to Ukraine and the Crimea. Telnov (2004) recorded *Ch. oricalcia* from Latvia. Records from Moscow reg. (Lindeman, 1871; Melgunov, 1892) should be confirmed. I have not seen the specimens of *Ch. oricalcia* from Central part of European Russia in ZIN and ZMMU. Such records as "Siberia" and "Mongolia" (Weise, 1916; Kippenberg, 2010) are probably connected with an erroneous synonymy: *ambulans* Faldermann = *oricalcia* Müller by Weise (1887a, 1898, 1916). Currently *Ch. oricalcia* is not recorded from Siberia and Mongolia (Medvedev, 1982; Medvedev, Dubeshko, 1992; Bieńkowski, 2010). *Chrysomela ambulans* Faldermann was originally described from Irkutsk (Faldermann, 1835). This name is *nomen oblitum* (see also Comment 284). In my opinion, it can be a senior unused synonym for *Ch. latimargo*.

104. Kippenberg (2010) included "*Chrysomela sahlbergi* Faldermann, 1837: 358" in the section "genus *Chrysolina*, *nomina dubia*". For the first time this species was briefly described in the publication by Ménétriés (1832) under the name "*Chrysomela Sahlbergii*, Fald." This description takes only two lines, 14 words. Five years later, Faldermann (1837) described "*Chrysomela Sahlbergii* mihi" in details. The description takes one and a half pages, is supplied with drawings of a general view and elytra. I compared the descriptions in Ménétriés (1832) and Faldermann (1837) and came to conclusion, that they belong to the same taxon. The authorship of the name *sahlbergii* should be attributed to F. Faldermann in the following way: "Faldermann in Ménétriés, 1832" (ICZN, 1999, 50.1.1).

Species group "*sahlbergii–rhodia–halysa*" is characterized by the following general features: hind wings reaching elytral apex or normally developed; apical projection of male aedeagus is narrow basally and spoon-like widened on end; male last abdominal sternite bearing deep impression. Two species of this group, namely *Ch. rhodia* and *Ch. halysa* (to include three subspecies), were described by Bechyné (1950a) (Fig. 12).

Figure 12. Distinguishing characters after Bechyné (1950a).

character	*rhodia*	*halysa halysa*	*halysa assyrica*	*halysa intercalaria*	*sahlbergii*
hind wings	not normally developed, reaching elytral apex, with venation reduced	not normally developed, reaching elytral apex, with venation reduced	not normally developed, reaching elytral apex, with venation reduced	not normally developed, reaching elytral apex, with venation reduced	normally developed, rather longer than elytra
brightness of pronotum and elytra	(not indicated)	pronotum more shining than elytra, at least in male	pronotum and elytra dull	(not indicated)	(not indicated)
humeral angles	obtuse, but distinct	entirely obsolete, rounded	entirely obsolete, rounded	entirely obsolete, rounded	obsolete
body shape	short oval	elongate	elongate	elongate	short oval
pronotal lateral sides	straight or almost so	distinctly rounded	distinctly rounded	distinctly rounded	almost straight
elytral punctures	sparse	sparse	sparse	dense	dense
length (mm)	8.5–9.5	7–8.5	8–9	8.5–9	7–8.5
type locality	Rhodes	Libanon	Iraq	Nakhichevan	S Azerbaijan
area besides type locality	Rhodes	Israel, Turkey, Cyprus	Iran, S Azerbaijan	Armenia	Turkey, Cyprus

According to Bechyné (1950a) (Fig. 12), differences in species and subspecies of this group are mostly related to shape of body, shape of elytral humeral angles (difficult to observe), shape of lateral sides of pronotum (difficult to measure), density of elytral punctures, body length. For the subspecies of *Ch. halysa*, Bechyné (1950a) proposed some additional characters: relative brightness of elytra and pronotum, presence / absence of wrinkles connecting punctures in elytral rows (difficult to formalize this character).

Kasap (1988) examined the type specimens of the taxa described by Bechyné (1950a) and came to the following results: 1) aedeagus structure is similar in *halysa halysa*, *halysa intercalaria*, and *rhodia*. Kasap (1988) had only female type specimens of *halysa assyrica* and *orientalis palaestina* at his disposal; 2) such characters as: shape and length of body, length of hind wings, density and size of elytral punctures, shine of pronotum and elytra do not differ in species and subspecies; 3) other diagnostic characters have not been found; 4) conclusion: all the following names: *halysa halysa, halysa intercalaria, halysa assyrica, orientalis palaestina, rhodia* are the

synonyms of *Ch. sahlbergii*. However, Kasap (1988) has not studied either types, or topotypes of *Ch. sahlbergii*.

I studied 419 specimens from Azerbaijan, Armenia, the N Caucasus, Dagestan, Georgia, Asia Minor, Rhodes (+ the island of Karpathos), Greece, Iran, Iraq, Lebanon, Syria, Egypt, Israel and Palaestine.

The following characters were examined:

A) Hind wings: 1 – normally developed, 2 – abbreviated: narrower and reaching elytral apex only.
B) Elytral humeral angles: 1 – projecting out of pronotal base laterally, 2 – not projecting out of pronotal base.
C) Body length and width (mm).
D) Pronotal lateral side: 1 – evenly rounded, 2 – rounded anteriorly, straight in posterior ⅔, 3 – almost straight along entire length.
E) Coloration of elytral background: 1 – blue, 2 – bluish green, 3 – golden green, 4 – bronze, 5 – coppery.
F) Quantity of punctures in 5th and 9th entire rows on elytra.

Results (Fig. 13). I could not find any geographic differences in the shape of aedeagus, elytral humeral angles, pronotal lateral side, and elytral puncturation. Regional differences relate to the development of hind wings, elytral coloration and, and, to a lesser extent – the size of the body. Normally developed hind wings and abbreviated ones occur in the specimens from the same localities. Other differences absent in these specimens. This allows me to consider the degree of development of the hind wings as intrapopulation variability. Specimens with normally developed and abbreviated hind wings are attributed to the same species. The percentages of specimens with normally developed / abbreviated hind wings and with different coloration of elytra differ in different regions. However, these differences do not allow me to distinguish the subspecies (the proportion of different specimens does not reach anywhere up to 75%).

Analysis of nomenclatural types and topotypes.

Chrysomela Sahlbergii

Syntypes were collected during one of two expeditions, held simultaneously in 1829–1830 in Transcaucasia, including S Azerbaijan: 1) the natural-scientific academic expedition, in which E.P. Ménétriés took part, or 2) botanical expeditions by A.I. Shovich. More precise information is not contained either in the publications or on the labels of the specimens.

Original description of "*Chrysomela Sahlbergii*" was published in 1832 in the article written by E.P. Ménétriés on the results of his own expedition. This description is very short. "Lenkoran" is indicated as a type locality. F. Faldermann is indicated as the author of the species in question. The latter probably means that the beetles were transferred for processing to Faldermann. Faldermann (1835, 1837, 1838) himself published a large work devoted to beetles of Transcaucasia on the materials collected by Ménétriés and Shovich. There is a detailed description of "*Chrysomela Sahlbergii* Faldermann" in the second part of this work (Faldermann, 1837).

The degree of development of the hind wings in *Chrysomela Sahlbergii* was not noted either by Faldermann in Ménétriés (1832) nor by Faldermann (1837). Bechyné (1950a) considered that there are two separate species: *sahlbergii* with normally developed hind wings and *halysa* with abbreviated ones. Before I could not find a type of *sahlbergii* and accepted this point of view. I designated a female with normally developed hind wings from Girkan Nature Reserve as a neotype

(Bieńkowski, 2012). Girkan Reserve is located 15 km from Lenkoran (the type locality after original publication). Now I believe that the selection of a type locality of a neotype was not entirely correct. Lenkoran is located on the sea shore in the lowland, and the Hyrkan Reserve is in the mountains.

Later, I found in ZMUH one male, which, judging by the labels, was received by Mannerheim from Faldermann. Besides that, this specimen is supplied with the labels "Persia" and "*sahlbergii* Faldermann". This male has abbreviated hind wings. It can be considered as a syntype with great probability (*Ovosoma* figures 1–4). The label "Persia" does not contradict the type locality "Lenkoran" mentioned by Faldermann in Ménétriés (1832). In 1829–1830, the Talish khanate (with its capital in Lenkoran) was a disputed territory of Russia and Iran (old name Persia). Other available specimens from Azerbaijan, including those from Lenkoran, belong to the same taxon as the syntype *Ch. sahlbergii*. Abbreviated hind wings occur in 83 % specimens from Azerbaijan.

Chrysomela cupreopunctata

This taxon was described from "Syria" (with the borders that existed in the middle of the 19th century). The authors, Reiche, Saulcy (1858), indicated two localities where this taxon was found in abundance, namely Beirut (the capital of Lebanon) and Damascus (the capital of Syria). In ZMMU (coll. Motschulsky) I found one male supplied with labels "*Chrysomela cupreopunctata*" and "type". This specimen corresponds to the original description and can be considered as a syntype. Other available specimens from Syria and Lebanon belong to the same taxon. They are conspecific with *Ch. sahlbergii*.

Chrysomela porphyrea Fairmaire nec Faldermann

Fairmaire (1865) described a species with the following characters: " <...> viridi-aenea vel aenea vel aeneo-cyanea <...>, <...> elytris <...> punctis cupreis sat distantibus impressis, interstitiis obsolete punctulatis <...>" under the name "*Chrysomela porphyrea* Faldermann". However, the mentioned characters are strongly divergent from those in *Ch. porphyrea* but they belong to *Ch. sahlbergii*. Therefore, *Chrysomela porphyrea* Fairmaire is a misidentification and unavailable name (ICZN, 1999, 49).

Chrysomela Sahlbergi var. *venefica*

The original description includes neither the number of the type specimens nor the type locality (Weise, 1884a). Available syntype, male (DEI) was collected in "Jerusalem" (*Ovosoma* figure 10). Therefore, Jerusalem is a type locality (ICZN, 1999, 76A.1.1). All other specimens from Israel and the Palestinian National Autonomy belong to the same taxon. They are conspecific with *Ch. sahlbergii.*

Chrysolina (*Ovosoma*) *halysa*

Four syntypes (2 males, 2 females) (NMP) were studied by Kasap (1988). I examined 8 syntypes (5 males, 3 females) (NMP) (*Ovosoma* figure 72). Hind wings are abbreviated in all specimens studied. Syntypes of *halysa* are conspecific with *sahlbergii*. The following specimens (examined by me) also belong to *sahlbergii:* 1) female from Palestine identified by J. Bechyné as *halysa*, 2) female from "Anti-Libanon, Zabdani", examined by J. Bechyné when he described a new species *halysa*, identified by him as *halysa*, but has not be included in the type series, 3) male from

"Anatolien, Konia" examined by J. Bechyné when he described a new species *halysa*, identified by him as *halysa*, but has not be included in the type series, 4) female from "Asia Minor" identified by J. Bechyné as *halysa*. Available specimens from Lebanon correspond to the original description of *halysa* and conspecific with *sahlbergii*.

Chrysolina (*Ovosoma*) *halysa assyrica*

Syntype, female (NMP) was examined by Kasap (1988) and me. Contrary to the original description of *halysa*, it has normally developed hind wings! This specimen is conspecific with *sahlbergii*. The following specimens (examined by me) are also conspecific with *sahlbergii*: 1) female identified by J. Bechyné as *halysa assyrica*; 2) male from Lenkoran, studied by J. Bechyné when he described *halysa assyrica*, identified by him as this taxon, but not included in the type series. Additional specimens from Iraq (male and female) correspond to the original description of *halysa assyrica* and conspecific with *sahlbergii*.

Chrysolina (*Ovosoma*) *halysa intercalaria*

Syntypes (3 males, 2 females (NMP) were studied by Kasap (1988) and me (*Ovosoma* figure 71). Among them, one male and 2 females have mounted, normally developed hind wings. This contradicts the original description of *halysa*! Syntypes are conspecific with *sahlbergii*. Among two additional males, collected by the same collector, in the type locality, but in 1914, one specimen has abbreviated hind wings, another has normally developed ones. One more female from Araks river valley was identified by J. Bechyné as *halysa intercalaria*. It is also conspecific with *sahlbergii*. I examined 3 more females from the type locality of *halysa intercalaria* (Nakhichevan) and N-W Iran (Tabriz). They correspond to the original description of *halysa intercalaria* and conspecific with *sahlbergii*.

Chrysolina (*Ovosoma*) *orientalis palaestina*

This subspecies was originally described on the base of the single specimen from "Paléstine: Mont Karmel". Specimens from Haifa have not been included by the author in the type series. Holotype (female) (NMP) was examined by Kasap (1988) and me. Holotype has hind wings abbreviated, reaching elytral apex (as it takes place in *sahlbergii*), but not strongly reduced as in *orientalis*. I believe *palaestina* to be conspecific with *sahlbergii*.

Chrysolina (*Ovosoma*) *rhodia*

Three syntypes (2 males, 1 female) (NMP) were studied by Kasap (1988); 6 syntypes (4 males, 2 females) (NMP) were studied by me (*Ovosoma* figure 70). Hind wings are abbreviated in all specimens examined. These specimens are conspecific with *sahlbergii*. I have at my disposal 29 more topotypes from Rhodes Isl. They correspond to the original description of *rhodia* and conspecific with *sahlbergii*.

Figure 13. Variability of *Ch. sahlbergii.*

region	hind wings (% of specimens)		elytral coloration (% of specimens)					number of specimens
	abbreviated, reaching elytral apex	normal	blue	bluish green	golden green	bronze green	coppery	
Azerbaijan	83	17	-	-	24	66	10	29
Armenia	64	36	-	-	27	64	9	11
North Caucasus + Dagestan	32	68	-	-	-	77	23	22
Georgia	71	29	-	-	16	64	20	51
Asia Minor	79	21	2	10	9	46	33	110
Rhodes Isl.	97	3	-	-	14	41	45	29
Iran	53	47	-	-	6	88	6	49
Lebanon	100	-	14	19	14	34	19	36
Syria	96	4	18	7	-	43	32	28
Egypt	100	-	-	-	-	65	35	17
Israel + PNA	94	6	25	19	25	19	12	16

105. *Chrysomela besseri* was originally described from "circa Charkoviam" [= E Ukraine: envir. Kharkov city]. The original description (Krynicki, 1832) is very brief ("Supra obscure fusco-aenea, elytris obsolete punctato-striatis, interstitiis punctulatis, limbo angusto rufo ad scutellum dilatato. long. 3". lat. 2"). Suffrian (1851) redescribed *Ch. besseri* Krynicki in details and described a new species *Ch. circumducta*. Marseul (1887) was the first to suppressed *besseri* Krynicki as a synonym of *circumducta* Suffrian. But before, Harold in: Gemminger, Harold (1874) separated these two taxa, and offered a new replacement name *cinctipennis* for *circumducta* Suffrian because of the homonymy with *circumducta* Ménétriés.

Harold in: Gemminger, Harold (1874) did not describe a new species *cinctipennis*. The following assertion by Bourdonné (2012) is also erroneous: "Harold a décrit *C. cinctipennis* sur les deux exemplaires de *C. circumducta* Suffrian, 1851". Bourdonné (2012) so decided on the grounds that Suffrian (1851) included 2 specimens from Sarepta (together with the specimen from Podolia) in the type series of *circumducta*. It was Sarepta that was chosen by E. Harold as a type locality for *cinctipennis*. However, it is incorrect. In fact, the type specimens for the replacement name are all type specimens of the replaced name (ICZN, 1999, 72.7.).

The synonymy *cinctipennis* (= *besseri* = *circumducta* Suffrian) was supported by Weise (1916). Bechyné (1950a) offered synonymy: *Craspeda* (= *Zeugotaenia*), and considered *Ch.* (*Craspeda*) *besseri* Krynicki as a valid species. Brovdij (1977) included *cinctipennis* Harold in the subgenus *Craspeda*, and Lopatin (1977) included this species in the subgenus *Chalcoidea*. Warchałowski (1993) considered *besseri* Krynicki to be a questionable synonym of *limbata* Fabricius. The collection by I. Krynicki was deposited in the Kharkov University (Ukraine). However, the type of *Ch. besseri* was not found there (K.S. Nadein, personal communication). I found two specimens labeled as "*Craspeda besseri*" in the collection by V. Motschulsky (ZMMU). The labels of these specimens do not indicate conclusively that they are types of *Ch. besseri* or even specimens received by Motschulsky from Krynicki. However, these labels indicate that these specimens were studied by Motschulsky when he described a genus *Craspeda*.

I believed that the systematic position of *besseri* should be established, because of *besseri* Krynicki is, on the one hand, a type species of the subgenus *Craspeda*, and on the other hand, *nomen dubium*. Therefore, I designated one of two specimens in Motschulsky collection as a neotype (Bieńkowski, 2007a). This specimen was collected in the type locality (Kharkov) and corresponds to the original descriptions of both, *besseri* Krynicki and *circumducta* Suffrian, and interpretation of *besseri* in the old, "historical" parts of the European museums which were

examined by me (MNHUB, DEI, MTD, NHMW, NMP). On the other hand, this specimen corresponds to the recent interpretations of *cinctipennis* Harold (Lopatin, 1977; Lopatin, Kulenova, 1986; Okhrimenko, 1990; Warchałowski, 2003, Bieńkowski, 2004a). Therefore, I establish a synonymy: *besseri* (= *cinctipennis* = *circumducta*). This point of view is supported in the recent Palaearctic Catalogue (Kippenberg, 2010).

106. *Chrysomela obscurata* Herrich-Schaeffer, 1839 was included by Kippenberg (2010) in the section "genus *Chrysolina*, nomina dubia". The characters of *obscurata* mentioned by the author, Herrich-Schaeffer (1839), in the key ("Wulst [Thorax] ganz durch tiefen Eindruck abgeschieden. Seiten des Thx [Thorax] gerundet. Schwarz, zwischen den Doppelreichen je nur Eine Reiche anderer Punkte.") and shown in the figure 164.2.c allow me to conclude that this name is conspecific with *Ch. oricalcia*. Pronotal lateral sides are sometimes very slightly rounded in *Ch. oricalcia*.

107. *Ch. hollandei* Bourdonné, 2012 was considered earlier (Bieńkowski, 2007a) within the species *Ch. carnifex*. I marked it as *Ch. carnifex* aff. *fossulata*, however the real *Ch. carnifex fossulata* was unknown to me (Bieńkowski, 2007a). I believe that the level of difference of *hollandei* from *carnifex* is sufficient for allopatric subspecies, but not separate species.

108. The subgeneric name *Chrysolina* (*Cyrtochrysolina*) was firstly published by Kippenberg, Döberl (1994) without a description. It is *nomen nudum*, unavailable name. Later, it was cited in new Palaearctic Catalogue (Kippenberg, 2010) as valid name "*Chrysolina* subgenus *Cyrtochrysolina* Kippenberg, 1994: 59". However, this subgenus still remained without a description, *nomen nudum*. Only two years later a description appeared (Kippenberg, 2012a). Therefore, available name for the subgenus in question is: *Cyrtochrysolina* Kippenberg, 2012a but not 1994.

109. Holotype and paratypes can be designated only in the original publication (ICZN, 1999, 73.1.1–3.). The mentions by Kippenberg (2012c) of the studied "holotypus" (e.g. for *Ch. porphyrea*) and "paratypus" ("paratypen") all refer to syntypes, since the holotype was not established in the original publication. Besides that, all these taxa, except *Ch. trapezicollis kutaisa*, are definitely based on more than one specimen (the respective original descriptions include the limits of variability in the size of beetles). The article ICZN (1999, 72.4.1.1) should not be interpreted in the sense that a "holotype" is a specimen bearing the label "holotype", if in the original publication the holotype was not designated. This article prescribes only which specimens to attribute to the type series, and which not to relate, but does not indicate what to consider as a holotype, and what is a paratypes.

Kippenberg (2012c) apparently refers to the label "holotypus" attached to the type specimen of *Ch. trapezicollis trapezicollis*, female (ZSM), studied by him. In the original description, the holotype was not designated (Bechyné, 1952a). In ZSM I examined a male of this taxon, bearing an original label handwritten by the author, Bechyné, as"HOLOTIPE ♂ *Chrysolina trapezicollis* m. J. Bechyné det., 1951". According to the structure of the tarsi and abdominal sternites, this is a male, but the aedeagus was previously extracted by someone and lost. Both specimens, female examined by Kippenberg and male examined by me, are really syntypes.

110. Holotype of *Ch. daccordiana* Kippenberg was deposited in a private collection contrary to the recommendation ICZN (1999, 16C).

111. Bourdonné (1977) studied a holotype (male) of *Chrysolina platypoda* Bechyné, 1950a and designated an additional specimen, female, as "neallotypus". The latter term is not used in ICZN (1999, 72–75).

112. Bourdonné (1988b) studied in MNHUB three specimens identified by Harold in: Gemminger, Harold (1874) as "*Chrysomela aethiops* Olivier". Contrary to ICZN (1999, 72.7), Bourdonné (1988b), considered them as "syntypes" of *Chrysomela provincialis* Harold, 1874. Bourdonné (1988b) designated "lectotype" and "paralectotypes" of *Chrysomela provincialis* based on these "syntypes". In fact, the name *Chrysomela provincialis* was proposed by Harold in: Gemminger, Harold (1874) as a substitute name for *Chrysomela aethiops* because of homonymy. Therefore, the name *Chrysomela provincialis* has not other type specimens besides the type specimens of *Chrysomela aethiops* Olivier.

113. According to the original description (Weise, 1884b), type localities of *Chrysomela Milleri* are "Nanos in Krain" [= Nanos Mt. in S-W Slovenia], and "Croatien" [= Croatia]. Bourdonné (1988b) examined in MNHUB (J. Weise collection) two specimens, identified by the author, J. Weise, as *milleri* but supplied with the label "Bosnia". Bourdonné (1988b) erroneously designated them as "lectotype" and "paralectotype" of *milleri*. These specimens, originating from Bosnia, and not from Slovenia or Croatia, can not be considered as type specimens.

114. Bourdonné (1998) noted that he designated earlier (Bourdonné, 1977) the species *Chrysolina platypoda* Bechyné as the type species for the subgenus *Chrysolina* (*Bechynia* Bourdonné, 1977) "by monotypy". It is a mistake. The original description (Bourdonné, 1977) of the subgenus *Bechynia* includes the following: "Species typica: *Chrysolina platypoda* Bechyné". Therefore, the type species was designated by the original designation but not monotypy (ICZN, 1999, 68.2)

115. Bourdonné (1998) noted that the type species *Chrysomela seriatopora* Fairmaire for the subgenus *Chrysolina* (*Atlasiana* Bourdonné et Doguet) was designated "by monotypy". It is a mistake. The original description (Bourdonné, Doguet, 1991) of the subgenus *Atlasiana* includes the following: "Espèce type *C. seriatopora* (Fairmaire, 1867)". Therefore, the type species was designated by the original designation but not monotypy (ICZN, 1999, 68.2)

116. According to the original description (Bechyné, 1949a), a subspecies *Chrysolina carnifex burdigalensis* was described on the base of the series of males and females collected in different years. Holotype was not originally designated, and all type specimens are syntypes. Therefore, the assertation by Bourdonné (2012) about "holotype" and "paratypes" is incorrect (ICZN, 1999, 73.1.3, 74.7).

117. Bourdonné (2012) designated a neotype of *Chrysomela cruentata* Suffrian. Bourdonné (2012) used for neotype designation a specimen originated from C Spain (Prov. Ciudad Real), erroneously believing that the taxon was described from Spain. In fact, *Chrysomela cruentata* was described from Portugal (Suffrian, 1851). To designate a neotype, it was necessary to select a specimen from a location more approximate to the type locality (ICZN, 1999, 75.3.6). In MNHUB I examined one specimen, which can be considered as a holotype of *Chrysomela cruentata*. If this is confirmed, the neotype should be rejected (ICZN, 1999, 75.8).

118. In the original description of *Chrysomela carnifex* the type locality was indicated as "Germania" (Fabricius, 1792). Bourdonné (1988b) designated a neotype of *carnifex* with the label

"Stettin" (= Szczecin). This city is in N-W Poland, but from 1720 to 1945 belonged to Prussia (Germany). Therefore, the choice of a type location for a neotype is justified. Later, Bourdonné, Doguet (1991) erroneously indicated a type locality of neotype *Chrysomela carnifex* as "Silésie (Pologne)". When Bourdonné (1988b) designated a neotype, he referred only to the absence of type specimens in one of the storage locations of the Fabricius collection, KUZM. Horn, Kahle(1935–1937) mentioned Zool. Univ. Mus., Kiel as storage location of the private collection by Fabricius. Besides that, type specimens by Fabricius are deposited in BMNH, KUZM, Hope Mus. Oxford, MNHN, and collection by E.F. Germar (it is partly deposited in MNHUB) (Horn, Kahle, 1935–1937). In MNHUB I examined 8 specimens of *Ch. carnifex*, which could be considered as syntypes. If their affiliation to a type series is confirmed, the neotype should be rejected (ICZN, 1999, 75.8).

119. Bourdonné, Doguet (1991) designated a lectotype of *Chrysomela femoralis* Olivier. Subsequently, Bourdonné (1999) designated a "neotype" for *Ch. femoralis* without any explanation why the previously designated lectotype is not suitable.

120. Jacobson (1893) described under the name "*Chrysomela angusticollis* Motsch." a species which differs from that described by Motschulsky (1860b) under the original name *Apterosoma angusticollis* Motschulsky. Therefore, *Chrysomela angusticollis* Jacobson, 1893 is unavailable name (ICZN, 1999, 49). Later, Jacobson (1901b) proposed a "new replacement name" *Chrysomela lineigera*. In fact, Jacobson (1901b) proposed a new name, not provided with a description, but supplied with a reference to the description of unavailable *Chrysomela angusticollis* Jacobson, 1893. Therefore, *Chrysomela lineigera* is available name (ICZN, 1999, 12.2.1). Its type specimens are those that have been identified by Jacobson (1893) as *Chrysomela angusticollis* (ICZN, 1999, 72.4.2).

121. The subspecies *Ch. cuprina dilecta* was originally described very briefly (Bechyné, 1952a): "Viel kleiner (5–6 mm) als die europäische Stammform, sehr stark glänzend bei beiden Geschlechtern, lebhaft kupferfarbig mit violettem Glanz" based on the specimens from Altai and the south of Krasnoyarsk Krai. The characters mentioned in the original description correspond to that of *Ch. difficilis*. The latter is the only species of the subgenus *Hypericia*, now known from southern Siberia. Bechyné (1952a) erroneously considered *Ch. difficilis* to be a subspecies of *Ch.* (*Allohypericia*) *aeruginosa*. On this basis, I suggested (Bieńkowski, 2012) that *Ch. cuprina dilecta* is the junior synonym of *Ch. difficilis*.

After the examination of the syntype *Ch. cuprina dilecta*, I confirm this synonymy. Syntype of *Ch. cuprina dilecta* entirely corresponds to morphological characters of available specimens of *Ch. difficilis* from Siberia. Medvedev, Dubeshko (1992) erroneously give a difference of the mentioned taxa: "punctures in elytral rows are not numerous, widely separated from each other" in *Ch. cuprina dilecta*, and "punctures in elytral rows are numerous, separated from each other by a distance not exceeding double the diameter of the puncture, differ little in size from the secondary punctures" in *Ch. difficilis*. Available specimens of *Ch. difficilis* from different places in Siberia have punctures in elytral rows unevenly placed. In the same row, the points are close to each other (the distance between them does not exceed the double diameter of the points), or they are much sparser (the distance between them is 4 times the double diameter of the points). "Secondary" punctures (i.e., punctures in the intervals) are 3–4 times smaller than the punctures in the rows in all examined *Ch. difficilis* specimens.

122. Type specimen of *Chrysomela gibbipennis* was considered by Bourdonné (2007) as "holotype by monotypy, ICZN, 1999, 73.1.2". Mikhailov (2009) wrote, that it was better to designate it as a lectotype, according to ICZN (1999, 73F), since the original publication does not indicate the number of specimens studied. I agree with Mikhailov (2009), but I continue to consider this specimen as a syntype, since neither Mikhailov (2009), nor Bourdonné (2007) designated the lectotype.

123. *Chrysomela undulata* Gebler and *Ch. undulata* Linnaeus are primary homonyms. These names are currently valid and related to different genera. The latter was included in the genus *Phyllocharis*, at least, since Baly (1889). Therefore, the replacement is not necessary (ICZN, 1999, 23.9.5).

124. The name *Chrysomela tibialis* Jacobson, 1895 was originally based on the single type specimen. This is clearly stated by the author (Jacobson, 1895) in the original description: "1 ♂ in coll. mea". This specimen should be considered to be holotype (ICZN, 1999, 73.1.2). Therefore, the specimen designated by Mikhailov (2009) as "syntype in MNHUB" is either the same specimen, a holotype, or another specimen, not attributed by Jacobson (1895) to the type series.

125. The name *Chrysomela tibialis* Suffrian, 1851 is a junior primary homonym of *Chrysomela tibialis* Duftschmid, 1825. The latter was considered to be *nomen oblitum*. The name *tibialis* Suffrian, 1851 was considered to be a valid name in the genus *Phratora*, at the suggestion by Silfverberg (1979), using the plenary power of the ICZN. *Chrysomela tibialis* Jacobson, 1895 is a junior primary homonym of *Chrysomela tibialis* Suffrian, 1851. However, the name *tibialis* Suffrian, 1851 is considered to be the valid specific name in the genus *Phratora* (= *Phyllodecta*), at least, since Weise (1887a). Therefore, the replacement of the name *tibialis* Jacobson by a new name *neotibialis* Kippenberg, 2010 is done in contrary to ICZN (1999, 23.9.5; 82.1), although the name *tibialis* Jacobson is available according to ICZN (1999, 16). I use the name *tibialis* Jacobson, 1895 as valid until the decision of the ICZN, as in similar cases with *Chrysomela cyanella* Gebler and *Ch. undulata* Gebler.

126. The subspecies *Chrysolina aegyptiaca aleppensis* Bechyné, 1955b was described on the base of the single specimen. The author, Bechyné (1955b) writes: "Typus: Syrie: Alep <...>", which is the designation of the holotype (ICZN, 1999, 73.1.1) (compare: in the same publication Bechyné (1955b) for the type series of another new taxon, *palmyrensis*, notes: "Typus: <...>. Paratypes: <...>"). I studied the holotype of *aleppensis* (by the photos kindly provided me by Eva Sprecher and Matthias Borer). Another specimen (NMB) from the same locality does not provide the author's identification label, but is supplied with the label "Lectotype" subsequently added. It is not a lectotype, since in the original publication another specimen is designated as a holotype.

127. Thanks to the courtesy of the curator of the collection of leaf-beetles of the British Museum, Michael Geiser and his volunteer assistant, photographer Derek Croucher, I had the opportunity to study from photos two syntypes of *Ch. coromandeliana*. One of them (with the label "Coromandel, S-E. India") is supplied with the label "Type H.T." Another specimen (with the label "Kanara, S-W India") is supplied with the label "Cotype". But in the original publication (Maulik, 1926) the holotype is not designated, so they are syntypes (ICZN, 1999, 73.1.3, 73.2). I agree with the opinion of Bechyné (1954b) and Daccordi (1980a), who studied these specimens, that *coromandeliana* is conspecific with *Ch. fastuosa*. Bechyné (1954b) writes that *Ch. fastuosa* is common in Uzbekistan and Kashmir and is rare in the rest of India. It assumes the correctness of

original geographical labels. However, Lopatin (2010) and Kippenberg (2010) do not indicate this species for Central Asia and India. I also do not have it from these regions. Probably, the geographic labels of the type specimens are incorrect.

128. Syntype of *Ch. marginata* var. *rugosopunctata* Roubal, 1917 (*Chalcoidea* figure 18: 5) is conspecific with the nominotypical subspecies of *Ch. marginata*. It is blackish-bronze with weak bluish tint at elytra, aedeagus with moderately long apical projection. *Ch. haemoptera* ab. *rugosopunctata* Halbherr in Reitter, 1912 was originally described as a intrasubspecific and therefore unavailable name. The replacement of the name *rugosopunctata* Roubal was not necessary.

129. *Ch. fuliginosa galii* is reported from Latvia by Kippenberg (2010). It is incorrect (Bukejs, 2013).

130. *Ch. aurichalcea* (Gebler in: Mannerheim, 1825) is found in Belarus and Latvia (Lopatin, Nesterova, 2005; Bukejs, 2013).

131. *Chrysomela variolosa* Linnaeus, 1767 is a primary senior homonym of *Chrysomela variolosa* Petagna, 1819. However, *variolosa* Linnaeus, 1767 is considered to be valid name in the genus *Clytra* since Olivier (1808), and in the subgenus *Clythra* (*Lachnaea*) by Lacordaire (1848). Presently, *variolosa* Linnaeus, 1767 is a valid specific name in the genus *Lachnaia*. Therefore, junior homonym *variolosa* Petagna, 1819 should not be replaced (ICZN, 1999, 23.9.5).). It is need to ask the International Commission on Zoological Nomenclature to use its plenary power for keeping the prevailing usage of the both names, *Chrysolina variolosa* (Petagna, 1819) and *Lachnaia variolosa* (Linnaeus, 1767) (ICZN, 1999, 23.9.5).

132. H. Kippenberg (personal communication) found *Ch. purpurascens notiophila* Bechyné, 1952a in Greece.

133. H. Kippenberg (personal communication) found *Ch. tani* Lopatin, 1998 from Sichuan and considered this species to be the member of the subgenus *Pezocrosita*.

134. The subspecies *Chrysolina* (*Chalcoidea*) *janbechynei murciana* was originally described on the base of the single specimen, female (see fig. in the chapter "Review of the subgenera... Species incertae sedis. *Chrysolina murciana*") . Its exact systematic position remains unclear before the finding of the male. The original description (Kippenberg, 2012b) includes the following characters: "Halsschild: <...> Seitenwulst durch eine nur wenig vertiefte, schmale und grob punktierte Rinne abgesetzt, diese an der Basis tiefer eingekerbt"; "Unterseite der Tarsen vollständig beborstet". These characters significantly deviates from those in *Ch. janbechynei*. In the latter, pronotal lateral impressions are shallow basally and obsolete anteriorly, not forming furrow, filled by moderately large, numerous, dense punctures, partly coalescent; all tarsomeres 1 bear broad longitudinal glabrous stripe beneath in both sexes. Such differences rather correspond to the level of interspecies differences in the respective subgenus. Besides that, the single known specimen (female, holotype) (examined by me based on photos) does not possess some valuable subgeneral characters (see "Review of the subgenera... Species incertae sedis"), and I can not include this taxon certainly in any existing subgenus. This taxon may belong to any of the following subgenera: *Chalcoidea*, *Diachalcoidea*, or *Palaeosticta*.

135. Seven specimens of *Ch. polita adamsi*, supplied with the label "Annam Laos" in HNHM, are probably the result of erroneous labelling.

136. I compared the type specimens of both, *dieckmanni* and *alaiensis*, and found them to be conspecific (*Chalcoidea* figure 4: 1–5). Lectotype of *dieckmanni*, male, is supplied with the label "Amur", and paralectotype, female – with label "Dsungarei, Karlyk-Tag, V.-VII.1908" (Karlyk-Tag is a mountain in Xinjiang). Both type specimens of *dieckmanni* are rather old. It is not established who collected the beetle, labeled "Amur" and when. Probably, this label is incorrect. The male is chosen as a lectotype for an accurate interpretation of the name. Karlyk-Tag is more likely type locality, especially since the holotype of *alaiensis* is accurately labeled, and the distribution of the latter is limited to Tien Shan.

137. According to the original description (Fairmaire, 1865), the type locality of *Chrysomela turca* is "Constantinople" [= Istanbul]. One specimen in FNMS is supplied with labels "type" [red] and "Asia minor, Biledjek" [= Bilecik]. I do not know definitely, whether it is a type or not, because Bilecik is 127 km S-E from Istanbul.

138. The subspecies *Ch. herbacea alacris* Bechyné, 1950a was originally described from Asia Minor. There are 2 specimens (male and female) from Syria identified by the author of this taxon, J. Bechyné, as subsp. *alacris* (FNMS). They are green, with elytra and pronotum rounded laterally, externally similar with the specimens from the Caucasus, male 8,4 mm long, female 9,8 mm long. Elytral punctures in these specimens from Syria are not weaker (puncturation looks even slightly stronger!) and not sparser, than in the specimens from Montenegro and Slovakia.

139. Examined specimens (male, female) of *Ch. herbacea* from Iran (Elburs, FNMS) are green, male is 7.9 mm, female is 10.1 mm long. Elytral puncturation is more irregular, than in those from Montenegro, puncturation of pronotal disc is fine and dense, body shape is not more parallel-sided, than in those from the Caucasus, pronotum is broadest basally (female) or parallel-sided in basal ⅓ and broadest there (male) as in the specimens from Montenegro.

140. There are two specimens of *Chrysomela campestris* Weise, 1912 in MNHUB. J.-C. Bourdonné supplied one of them with a label "lectotype". The name *campestris* was proposed by Weise (1912) for the taxon, erroneously identified by Marseul (1886) as *perforata* Gebler. All specimens examined by Marseul (1886), as well as the specimens studied by Weise (1912), should be included in the type series of *campestris* (ICZN, 1999, 72.4.2).

141. Three syntypes (females, NMP) of *Ch. marginata sculpticollis* have prosternum with high medial keel along entire length, this keel is connected anteriorly with the ridges on anterolateral portions of prosternum. Externally, these females are similar with *Ch. interstincta subseriata*. This allows me to consider *sculpticollis* as a synonym of *Ch. interstincta subseriata*.

142. Syntype of *pseudolurida* (DEI) is characterized by the following features: elytral intervals are very finely and sparsely punctate; pronotal disc is reticulated, smooth, without punctures; pronotum laterally rounded and strongly convergent forward, with lateral impressions deep in basal ⅓, absent in anterior ⅔ and replaced there with large separate punctures; body is short-oval; elytral suture is darkened. Type specimen in NMB ("paralectotype" designated by Bourdonné, 2005), female also corresponds to *lurida* Linnaeus but not *imperfecta* Breit by the shape of pronotal lateral impression.

143. The name *Chrysolina mikhailovi* Ge et Daccordi, 2011 was published on 17.02.2011, as specifically indicated in the journal. The name *Chrysolina mikhailovi* Lopatin, 2011 was published in the original Russian edition of "Entomological Review", volume 90, issue 2. The exact date of release from the press can not be established, since "Entomological Review" does not specify such a date. Date of signing the issue for printing is 25.05.2011 (it is indicated in the Issue). The journal actually comes out a month later. Therefore, *mikhailovi* Ge et Daccordi is a senior homonym of *mikhailovi* Lopatin. After studying the holotype of *Chrysolina mikhailovi* Lopatin (*Medvedevlevna* figure 13), I came to the conclusion that this taxon is conspecific with *Ch. pudica*.

144. The subspecies *Ch. umbratilis erudita* was originally described from "S. Hungary". The type locality, Bihar, is now located on the territory of Romania. According to the original description (Bechyné, 1952a), this subspecies is characterized by the following characters: dorsal side very shining, pronotum without reticulation, dorsum covered with fine punctures, especially on elytra. Available specimens from S Hungary (3 males, 4 females) and Romania (2 males) do not differ from the nominotypical subspecies either in elytral punctures finer, or in shining of dorsum stronger (in females, pronotum and elytra are distinctly reticulated and less shining than in males). There are different specimens from S Hungary: 1) with shining pronotum and elytra, 2) with shining pronotum and dull, reticulated elytra, 3) with dull, reticulated pronotum and elytra. Available specimens of the nominotypical subspecies from Saxony, Poland, Czechia, and Ukraine also vary: some are shiny and smooth, while others are silky reticulated from above. I did not find other differences of *erudita* from the nominotypical subspecies.

145. The species, originally described as *Chrysolina furialis* Lopatin, 2013, is transferred here to the genus *Suinzona* Chen, 1931 on the base of the following characters: anterior coxal cavities almost closed posteriorly; prosternal process very wide; prothoracic hypomeron without puncturation, lateral margins of pronotum invisible from above; hind wings absent (Fig. 14). This species is close to *S. belousovi* (Lopatin, 2002). Revision of the genus *Suinzona* was published recently (Ge, et al., 2011a).

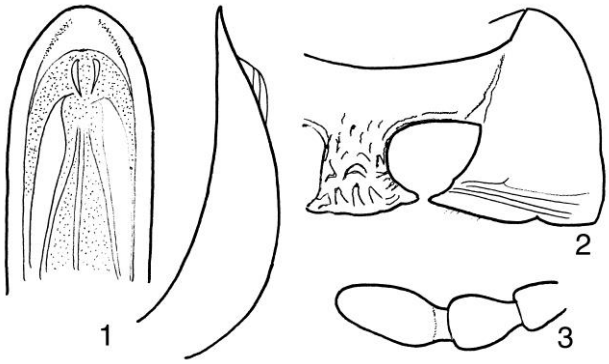


Figure 14. *Suinzona furialis*, holotype, male (Sichuan): 1 – aedeagus, dorsal and lateral view, 2 – prosternum, 3 – maxillary palpus. (Orig.).

146. *Chrysolina banksi* is recently discovered in N America (California), numerous adults and larvae were found on *Stachys, Mentha, Leonotis* (Lamiaceae) (Gilbert et al., 2007).

147. *Chrysolina quadrigemina* was introduced in New Zealand (Fraser, Emberson, 1987), S. Africa (Gordon, Kluge, 1991), and Chile to control weed plant *Hypericum*, and recently recorded in S

Argentina (Turienzo, 2006). It was also introduced (probably, unintentionally) in Madeira Isl. (Erber, Aguiar, 2001).

148. The record of *Ch. staphylaea lederi* in the N-W Caucasus (Novorossiysk, Gelendzhik) (Bogdanov-Katjkov, 1921) should be confirmed.

149. *Chrysomela lederi* Weise, 1878. Lectotype (*Chrysolina* s.str. figure 4), male, is designated here, with labels: "Kaukas. O.Schneider.", "Lederi Jemlekli", "Staatl. Museum für Tierkunde Dresden", "Lectotype Chrysomela lederi Weise, 1878. Bieńkowski design., 2001" [red]: male (MTD). Paralectotypes with labels: "Kaukas Leder", "Holotypus 1879 Chrysomela lederi Weise" [word "Holotypus" and margins red], "Ch. Lederi Weise Typ. Ca.", "Coll. Reitter": 1 spec. (HNHM). "Kaukas Leder", "Paratypus 1879 Chrysomela lederi Weise" [word "Paratypus" and margins red], "Ch. Lederi Weise Typ. Ca.", "Coll. Reitter": 2 spec. (HNHM). "Caucasus Leder", "Paratypus Chrysomela lederi Weise" [word "Paratypus" and margins red], "496 168", "Coll. Reitter": 1 spec. (HNHM). "Caucasus Leder", "Paratypus Chrysomela lederi Weise" [word "Paratypus" and margins red], "Lederi Weise Caucas", "496 167": 1 spec. (HNHM).

The subspecies *lederi* is better distinguished from the nominotypical one by slightly ordered paired elytral rows, while the shape of pronotal lateral impression and lateral callus is sometimes similar in a nominative subspecies.

150. The title of the original description of var. *palliata* Jacobson, 1901b is as follows: "var. *palliata* nov. (*Chrys. palliata* Mannh. in litt.)". The material at the end of the description is as follows: "Ochotsk (F. Sahlb.) – 1 ♀". In the foreword to this article, Jacobson (1901b) writes that F. Sahlberg arrived early in the spring of 1841 from Sith Island to Okhotsk, climbed the mountain Morakan, and then traveled through Yakutsk and Irkutsk to Dauria. The specimens collected by this expedition were provided only with the labels "Dauria" or "Ochotsk" without the dates of collection.

A specimen found in ZIN and equipped with a golden circle and a label: "*Chrys. palliata* Month ajan" can not be considered as a type, because the geographical label does not match. In addition, it is unlikely that F. Sahlberg left Okhotsk 500 km to the south-west to Ayan.

Weise (1916) and Kippenberg (2010) considered *palliata* to be a synonym of *daurica*. It is incorrect. Fine and more rare than in *staphylaea* s.str. punctures of the upper side are mentioned in the original description of *palliata*: "Punctura superficei supernae subtilior ac nonnihil rarior quam in typo" (Jacobson, 1901b). On the other hand, *daurica* is characterized by a larger and more dense elytral puncturation than *staphylaea* s.str. Available specimens from Okhotsk and Magadan correspond to the characters of the subspecies *staphylaea* s.str. This allows me to consider *palliata* to be synonym of *staphylaea* s.str.

151. I believe *Ch. pliginskii, Ch. apsilaena, Ch. rosti* to be the members of *Colaphoptera* (sensu Kippenberg, 2012a). Taxonomic position of *Ch. caspica* is some doubtful because of very obsolete apical denticles of aedeagus. But I think, it is a member of *Colaphoptera* too.

152. According to Petitpierre (1988), the species of the subgenus *Chrysolina s. str.*, including *Ch. staphylaea*, *Ch. banksi* as well as *Ch. costalis* and *Ch. wollastoni* have 2n = 23 chromosomes (they lack the Y-chromosome), whereas the males of *Ch.* (*Rhyssoloma*) *fragariae* have 2n=24 chromosomes (with both X and Y). Kippenberg (2010) considered *Ch. costalis* and *Ch. wollastoni* as members of the subgenus *Chrysolina* s.str.

I transfer *Ch. costalis* and *Ch. wollastoni* from *Chrysolina* s.str. to *Ch*. (*Rhyssoloma*) because they share the following characters of *Ch. fragariae*, the type species of the subgenus *Ch*. (*Rhyssoloma*): 1) prothoracic hypomeron without distinct impression, wrinkles and lateral border (prothoracic hypomeron laterally with shallow impression filled by weak wrinkles, with outer border, at least anteriorly, in *Chrysolina* s.str.), 2) elytral punctures arranged in 11 regular paired rows (dense, mostly irregular puncturation in *Chrysolina* s.str.), 3) claw tarsomere without distinct denticles, but its apical margin projected, 2–denticulate at underside (without denticles and denticulate apical margin in *Chrysolina* s.str.), 4) pygidium with broad longitudinal impression in basal ½–⅔ only (with weak longitudinal impression along entire length in *Chrysolina* s.str.).

153. *Chrysomela fortunata* was originally described on the base of the single specimen from Palma Isl. and compared with *Ch. obsoleta* (= *costalis*). I examined the holotype of *Ch. fortunata* (Unnamed species groups of subgeneric rank. *Chrysolina fortunata* figures 1–3). It wholly corresponds to the original description (Wollaston, 1864). Such diagnostical characters of *fortunata* as bluish tint on dorsum, pronotal puncturation (more distinct), and elytral puncturation (finer) occur in some available specimens of *costalis* from Tenerife Isl. However, pronotal shape (evenly and gradually attenuated from base to apex), anterior pronotal angles (acuter), and bright rufous coloration of antennae and legs permit me to distinguish *fortunata* from *costalis.* Besides that, I found that *fortunata* differs from *costalis* in pronotal lateral impression basally shallower and not fold-shaped, pronotum laterally more weakly swollen, prosternal basal fold absents, elytral epipleura well visible along entire length. I consider *Ch. fortunata* as a valid species, *incertae sedis*.

154. Gmelin (1790) in the original description of *Chrysomela crassipes* referred to Zschach (1789). But Zschach (1789) have not offered the specific name for this taxon, and published only a description (without a name!). This description was included in Gmelin's work (1790) word for word. Gmelin (1790) was the author who suggested a name "*crassipes*" for this taxon. Therefore, the author of *crassipes* is Gmelin.

The name *Ch. crassipes* Gmelin, 1790 absents in the catalogues by Gemminger, Harold (1874) and Weise (1916). It is probably *nomen oblitum*, according to ICZN (1999, 23.9.1). Besides that, it is a senior primary homonym of *Ch. crassipes* Lucas, 1849. Formally, the requirement of the article ICZN (1999, 23.9.1.2) is not met. The name of the rare Algerian species, *Ch. crassipes* Lucas, is used as a valid one only by: Gemminger, Harold (1874), Peyerimhoff (1915), Weise (1916), Bourdonné, Doguet (1991), Bieńkowski (2001), Kippenberg (2010). However, I consider it appropriate to continue using the name *crassipes* Lucas as a valid name and transfer this question to the International Commission on Zoological Nomenclature according to ICZN (1999, 23.9.3).

155. A taxonomic placement of *Ch. abchasica* is very doubtful. Bechyné (1950a) included this species in the subgenus *Colaphoptera*. Then Bechyné (1952a) revised his point of view and wrote that this species belongs to the subgenus *Hypericia* "mit seinen subgenerischen Charakteren" and "durch alle Merkmale". According to this author, *Ch. abchasica* is close to *Ch. hyperici daghestanica* because of the reduction of hind wings (Bechyné, 1952a treated the latter taxon incorrectly and identified the Caucasian specimens of *Ch. hyperici* with weak pronotal impression as "*hyperici daghestanica*"). This point of view was supported by Lopatin, Konstantinov (1991, 1995), noting, however, the unusual for the subgenus *Hypericia* aedeagus structure in *Ch. abchasica*. Bieńkowski (2001) transferred *Ch. abchasica* back to *Colaphoptera*. Now I think that the combination of body shape (convex, broad), pronotum (without lateral impressions, but with numerous large punctures laterally), elytra (regular puncture rows), palpi (last palpomere broadly

oval, as wide as penultimate one), color of antennae (yellow or brown, non-metallic), tarsi (tarsomeres 1–3 with entire sole in both sexes, broader in male than in female) and aedeagus (broad and short, flattened dorso-ventrally) permit us to place *Ch. abchasica* close to the subgenus *Atlasiana*, rather than *Colaphoptera*, *Chrysolina s.str.*, *Sphaerochrysolina*, *Cyrtochrysolina*, or *Lopatinica*.

It is also interesting, that the host plants of *Ch.* (*Atlasiana*) *seriatopora* and *Ch. abchasica* are the same, namely species of the genus *Hypericum* (Bourdonné, Doguet, 1991 concerning *Ch. seriatopora*; Okhrimenko, 1993 and personal observations concerning *Ch. abchasica*).

Thus, in the Mediterranean super-province (according to Kryzhanovsky, 2002), three closely related species inhabit the Atlas Mts. (southern Mediterranean province) – *Ch. seriatopora*, the Pyrenees (western Mediterranean province) – *Ch. pourtoyi*, and in the Caucasus (Crimean-Caucasian province) – *Ch. abchasica*, one species in each province. Beetles from different families in this super-province are characterized by ancient phylogenetic relations (Kryzhanovsky, 2002).

156. Bourdonné (2010b) suppressed *Taeniochrysea* as a synonym of *Chrysolinopsis* and justified this action very briefly: "in absence of distinctive characters". The author of these subgenera, Bechyné (1950a), distinguished them mainly by the position of the elytral epipleura behind the middle: inverted in *Chrysolinopsis* (an unique feature in the genus *Chrysolina*!), or horizontal in *Taeniochrysea*. To the distinguishing characters of these subgenera, I can add also: 1) elytral puncture rows consist of very sparse punctures (10–12 ones in 4th or 5th row) in *Chrysolinopsis*, and very dense punctures (about 50) in *Taeniochrysea*; 2) anterior process of metasternum immarginated in *Chrysolinopsis*, it is marginated in some *Taeniochrysea*; 3) aedeagus almost cylindrical in cross-section in *Chrysolinopsis*, it is flattened dorso-ventrally in *Taeniochrysea*; 4) last maxillary palpomere is slightly broader than penultimate in *Chrysolinopsis*, as wide as penultimate in *Taeniochrysea*. So, I consider these subgenera as separate ones.

157. Daccordi (1980b) in the original description of *Pseudotaeniochrysea* distinguished this subgenus from *Taeniochrysea* by the following characters: 1) last maxillary palpomere more distinctly truncated [in my experience, the shape of this palpomere does not differ in many specimens of *Ch. americana* and *Ch. superba*, the type species of *Taeniochrysea* and *Pseudotaeniochrysea*, respectively], 2) distinct furrow separating anterolateral portions of prosternum from prothoracic hypomeron [in my experience, this furrow is deeper in some specimens of *Ch. superba* than in *Ch. americana*, but in other specimens it is shallow for both species], 3) anterior projection of metasternum immarginated medially between coxae. The last feature is the only one that distinguishes *Pseudotaeniochrysea* from *Taeniochrysea*, but it is not absolute. There are two available specimens of *Ch. superba* from Ethiopia with entirely marginated metasternum.

All other details of the structure are almost identical in *Ch. superba* and *Ch. americana*. These include: puncturation of pronotum and elytra, structure of prothoracic hypomeron, tarsi, last abdominal sternite, and pygidium, very characteristic, striped color of the elytra, and general plan of the aedeagus structure. All this points to the relationship of *Pseudotaeniochrysea* and *Taeniochrysea*. In the genus *Chrysolina*, most subgenera are sufficiently far from each other, so that relationships can often not be traced. In this connection, it seems to me possible to consider *Ch. americana*, *Ch. superba*, and *Ch. ambrostomoides* in the same subgenus, despite the presence of the character of a "great taxonomic value" (immarginated metasternum) in the last two species under consideration, but in this case the only real difference. *Ch. superba* and *Ch. ambrostomoides* inhabit mainly E Africa from Sudan to S Africa, *Ch. superba* is most abundant in Ethiopia. In E

Africa there are mountain ranges – the Ethiopian Highlands, the mountains of Kenya and Tanzania, in the fauna of which many species from Palaearctic genera such as *Trechus, Calathus, Amara* have been found. These genera probably penetrated into these mountains in a geologically recent time (Kryzhanovsky, 2002). This fact can also serve as a justification for the relationship of the African *Ch. superba* and *Ch. ambrostomoides* and the Mediterranean *Ch. americana*.

158. The name *laeta* was originally published by Weise (1882) for the variation of the species *Chrysomela hemisphaerica* based on the different coloration: "Var. c. *laeta:* Supra saturate viridis". The author, Weise (1882) says that specimens with green coloration are very rare. It is impossible to conclude with certainty that the author had in mind the subspecific or intraspecific rank of the name. In his subsequent catalog Weise (1916) considered *laeta* as an aberration. Bechyné (1950a) and Warchałowski (1993) treated *laeta* in the same rank of aberration. However, Kippenberg (2010) considered it as a subspecies *Ch. purpurascens laeta* with the type locality "Slovenia". Weise (1882) did not mention the type locality of *laeta*, but only the whole area of the species *hemisphaerica*: E Alps, especially Styria. Thus, it can not be concluded that Weise (1882) had the specimens of *laeta* precisely from Slovenia. Kippenberg (2004b) mentioned the green specimens from central Slovenia. They were found there together with coppery and violet ones. I have at my disposal the green specimens from N-E Italy (near the border of Slovenia). Therefore, *laeta* can be attributed as a color aberration of the subspecies inhabiting Slovenia (*Ch. purpurascens rufocuprea*).

159. *Ch. purpurascens* is a very polymorphous species in coloration, body shape and aedeagus structure. Even in a limited area, for example, in Slovenia, and even among the specimens from the same population there is a large variability in the shape of aedeagus (Kippenberg, 2004b). The three most distinct forms can be distinguished among this variety:

1) nominotypical subspecies: pronotum is laterally roundly narrowed forward and usually constricted basally; metallic shine of the upper side of the body is coppery or violet, rarely bronze; aedeagus is moderately narrowed at apex. This subspecies occurs in western, northern, and northeastern parts of the specific area. I have the specimens from France, Germany (Saxony, Bavaria), Slovakia, Hungary, S-E and S Poland. The subspecies is widespread up to the Ukrainian Carpathians to the east (Brovdij, 1977).

2) subspecies *crassimargo*: pronotum laterally straight or weakly rounded and narrowed forward, broadest basally; metallic shine of the upper side of the body is bronze, coppery, violet, blue, rarely green; aedeagus is moderately or strongly narrowed and drawn out at apex. This subspecies occurs in southern part of the specific area except the southeast. I have the specimens from N-E Italy, Austria, Slovenia, Croatia, Bosnia-Herzegovina, and Banat area (border of Romania and Serbia).

3) subspecies *notiophila*: pronotum is laterally roundly narrowed forward and constricted basally; metallic shine of the upper side of the body is bronze (in the available male) or pitchy brown (according to the original description, Bechyné, 1950a). Probably, Bechyné (1950a) described an immature specimen, legs and antennae were described by him as light brown with copper shine. Aedeagus at the apex is not narrowed, with projecting denticles. This subspecies occurs in the southeastern part of the specific area.

160. The senior of the names proposed for the geographical subspecies of *Ch. purpurascens*, which inhabits the southern part of the specific range and differs from the nominotypical subspecies by the almost straight lateral sides of the pronotum, is *hemisphaerica* Germar, 1817. However, this

name is invalid because of the primary homonymy. The next in seniority name is *crassimargo* Germar, 1823, described from Slovenia ("Carniolia"). In the original description (Germar, 1823) the sides of the pronotum are described as follows: "Thorax <...> lateribus obliquis". Suffrian (1851) described pronotal lateral sides in *crassimargo* as follows: "die Seiten wenig gebogen, nach vorn convergirend" and added Hungary to the area of this taxon (after the specimens being at my disposal, Hungary belongs to the area of the nominotypical subspecies!). Weise (1882) specifically noted for *crassimargo*: "prothorace <...> lateribus antice leviter rotundato-angustatis", contrasting this taxon and *hemisphaerica*, in which "prothorace <...> lateribus subrectis". Marseul (1886) noted for the pronotum in *crassimargo*: "côtés obliques, faiblement courbés". Reitter (1912) contrasted *hemisphaerica* + *crassimargo*, in which pronotum from the base to the top straight, conically narrowed, and some other species including *purpurascens*, in which pronotum rounded laterally. However, Bechyné (1950a) accepted the interpretation by Weise (1882) and pointed out that pronotal lateral sides are more or less rounded in *crassimargo* and *purpurascens*, while they are straight or almost straight in *hemisphaerica*. The latter point of view was supported by Mohr (1966b), Kippenberg, Döberl (1994), and Warchałowski (2003). Kippenberg (2004b) pointed out that pronotal lateral sides are straight or almost straight in the specimens from Central Slovenia, but towards the north of Slovenia the shape of the lateral sides changes, they become rounded. He used the name *crassimargo* for the last taxon from N Slovenia. The correctness of such a decision is not obvious for me. Types of *crassimargo* are probably lost. After Horn, Kahle (1935–1937), they should be deposited in MNHUB (they absents there, personal communication by H. Kippenberg) and in DEI (they absents there, my observation). The original description of *crassimargo* does not include the explicit indication of the rounded sides of the pronotum, but rather the opposite (Germar, 1823). Among the 14 available specimens of *Ch. purpurascens* from Slovenia, 13 have straight sides of the pronotum. In my opinion, the name *crassimargo* should be related to this form, the most common in Slovenia.

161. *Ch. blanchei* was originally described from "Syria" within the boundaries of the 19th century (Fairmaire, 1865). Now *Ch. blanchei* is known from Egypt, Syria, Lebanon, Israel, Cyprus, and Asia Minor (after Bechyné, 1950a and material examined). A subspecies *Ch. blanchei nilotica* Bechyné, 1950a was described from Egypt (Cairo).

After the original description (Bechyné, 1950a), *Ch. blanchei nilotica* differs from the nominotypical subspecies as follows (Fig. 15).

Figure 15. Characters of *Ch. blanchei blanchei* and *Ch. blanchei nilotica* after Bechyné (1950a).

character	*Ch. blanchei blanchei*	*Ch. blanchei nilotica*
pronotal lateral impression	developed along entire length	developed posteriorly, obsolete anteriorly
punctures in pronotal lateral impression	relatively scattered and slightly fused	large, wrinkled and merged

In the original description of *nilotica*, Bechyné (1950a) does not talk about the impression, but about the lateral callus of pronotum, which is "convex along the entire length" or "only posteriorly", in *Ch. blanchei blanchei* and *Ch. blanchei nilotica*, respectively. In my understanding, a convex lateral callus presents in both subspecies, if one looks at the pronotum from the lateral side. Many authors (including Bechyné, 1950a) usually understood under the "convex" callus such a form of the callus when it is separated from the pronotal disc by an impression. In the case when the callus presents, but is not separated from the disc, they said that callus absents. In my

understanding, the callus really absents when the lateral side of pronotum is completely not convex above the lateral margin in lateral view.

A study of 107 specimens from the area of nominotypical subspecies (including a syntype from Beirut which belonged to Syria in the 19 century) has shown: A) the shape of pronotal lateral impression is variable: 1) shallow or moderately deep along entire length, 2) shallow anteriorly and deeper posteriorly, 3) almost obsolete anteriorly and developed posteriorly, 4) deepened anteriorly and posteriorly; B) the punctures in pronotal lateral impression are variable: 1) large or fine everywhere, sparse, separated from each other, 2) large and sparse anteriorly, denser and partly merged posteriorly, 3) large and numerous anteriorly, less numerous and separated from each other posteriorly.

The studied syntype of *nilotica* in ZSM has the following features: pronotal lateral impression is rather deep in basal ½, very shallow in anterior ½, covered by sparse punctures at most part, with only several punctures partially merged at the most basal margin. Examination of the 83 topotypes of *nilotica* (from Cairo) showed that the shape of lateral impression varies; it is: 1) shallow in anterior ½ and rather deep in posterior ½, 2) shallow along entire length, 3) almost obsolete in anterior ½ and moderately deep in posterior ½. Punctures in pronotal lateral impression are also variable: 1) large, dense, partially merged everywhere, 2) fine, sparse, mostly separate or (rarely) mostly merged.

Thus, the studied features are subject to considerable variability, but do not allow us to distinguish the geographical forms – subspecies.

162. *Chrysomela subincrassata* Duftschmid, 1825 was considered by Weise (1916) and subsequent authors (e.g., Bechyné, 1950a) to be a synonym of *Ch. marcasitica marcasitica*. However, *Ch. marcasitica marcasitica* is known from the Alps, while Linz city, from which *subincrassata* was described, is separated from the Alps, lying to the south of it, by the Infirtel lowland, but from the north Linz city adjoins the low mountains Mylviertel which adjacent to the Czech Massif. Therefore, it is more logical to assume that *subincrassata* is conspecific to the subspecies *Ch. marcasitica turgida*, spread in the nearby Sudetes and Carpathians.

The original description of *subincrassata* does not contain the characters that allow us to attribute this name to *Ch. marcasitica marcasitica* or *Ch. marcasitica turgida*. Type specimens by C. Duftschmid are lost (Gusenleitner, 1984). It is necessary to study the material from the environs of Linz and designate a neotype to establish of the taxonomic position of *subincrassata*.

163. Until now the subspecies *Ch. sacarum embiensis* was known only from the type locality (W Kazakhstan, Emba river, near Kulsary vill.). I found two more localities of this taxon in W Kazakhstan: Mangyshlak Penins.: Zharmysh vill., and Aral Sea: Barsakelmes Isl.

164. *Chrysomela polita* was originally described on the base of uncertain number of specimens, and without the information on the type locality (Linnaeus, 1758). There are two syntypes in LSL. One of them has pronotum red margined with green (it represents color form № 3, see below). This specimen is devoid of geographical label. Another specimen with pronotum violet (color form № 9, see below) is associated with geographical label "England" (http://linnean-online.org/24650/). Therefore, "England" should be considered as the type locality. According to Yang (2014), the lectotype of *Ch. polita* was designated in LSL. However, I could not find any information about the lectotype designation on the web-page of LSL.

Chrysomela Adamsi was originally described from "Chinese Tartary" [= Xinjiang, Mongolia, Manchuria, Qinghai, and Tibet] and "Eastern Siberia". The coloration of head, pronotum, and

underside was mentioned there as following: "nigro-aut, viridi-cyanea" (= blackish blue or greenish blue) (Baly, 1879).

Recent literature considers *Ch. polita* to include two widely distributed subspecies, namely, *Ch. polita polita* and *Ch. polita adamsi*. They occupy western and eastern parts of the specific area, respectively, and can be separated by the following characters (Fig. 16).

Figure 16. Characters of *Ch. polita polita* and *Ch. polita adamsi* in literature sources.

Ch. polita polita		*Ch. polita adamsi*		Reference
head, pronotum, and underside	distribution	head, pronotum, and underside	distribution	
green with golden or bronze reflection	Kazakhstan (steppe, river valleys), W Siberia, Altai, Europe, Syria, Israel	blue, bluish green	S-E Kazakhstan, Kyrgyzstan, N-W China, Mongolia	Lopatin (2010)
		blue	Inner Mongolia, Xinjiang, Siberia, Iran	Yang (2014)
	Europe (widely distributed), Asia: Cyprus, Israel, Kyrgyzstan, Kazakhstan, Lebanon, Mongolia, Syria, Turkey, Uzbekistan, W Siberia		E Siberia, Far East, Iran, Kazakhstan, Inner Mongolia, Shandong, Xizang	Kippenberg (2010)
		green, blue	N China (Shantung, Mongolia, Sinkiang), Siberia, Iran	Gressitt, Kimoto (1963)
green with golden or bronze reflection	Caucasus, W Siberia, European Russia, N Kazakhstan (steppe)	blue, bluish green	S Kazakhstan, Kyrgyzstan, N-W China, Mongolia	Lopatin (1977)
green with golden or bronze reflection	Europe, Siberia, Kazakhstan (steppe, foothills, river flood plains)	blue, bluish green	S-E Kazakhstan (Ketmen ridge, Trans-Ili Alatau Mts.)	Lopatin, Kulenova (1986)
green, usually with disc purplish-red, rarely bluish-green	Palaearctic, including European Russia, Caucasus	dark violet or blue	Siberia, Iran, W and N China	Bieńkowski (2010)

Comments

The examination of the great number of specimens (more than 600) from different parts of the area permits me to come to conclusion that the continuous series of color forms exists instead of two geographic taxa (Figs. 17–19).

These color variations can be distributed over the spectrum of sunlight:

1) pronotum blackish purple, margined by dark purple,
2) pronotal disc dark purple, narrowly margined anteriorly and posteriorly with golden, with lateral calli golden purple,
3) pronotal disc and lateral calli golden purple, margined anteriorly and posteriorly with golden,
4) pronotal disc golden purple, margined with green anteriorly and posteriorly, with lateral calli green,
5) pronotum green, with disc golden with weak purple reflection,
6) pronotum green, with disc golden green,
7) pronotum green narrowly margined with blue,
8) pronotum bluish green, narrowly margined anteriorly and posteriorly with violet, with lateral calli violet,
9) pronotum violet, with disc bluish violet,
10) pronotum entirely violet.

Variants 1–6 represent the nominotypical subspecies, and (7) 8–10 – the subspecies *adamsi* in recent interpretation.

Variants 1–4 are common in Europe (including European Russia from north to south), in the Caucasus, in the plains of Kazakhstan, in the Tien Shan, in the south of Siberia (to Lake Baikal eastward), and also (isolated) in the south of the Far East.

Variants 5–7 are generally distributed in the same way as 1–4, but more abundant than 1–4 in the Caucasus and Tien Shan; in Siberia, along the Yenisei valley, they go further north (to the Arctic Circle).

Variants 8–10 are rare in Europe and the Caucasus, common in Tien Shan, W and E Siberia, the Far East.

Thus, there is a geographical variability of the color of the pronotum from the red through the golden, green, blue, to the violet in the direction from the west to the east. Variability is continuous, and geographic isolation is absent. This does not give grounds for the recognition of the separate subspecies within *Ch. polita*.

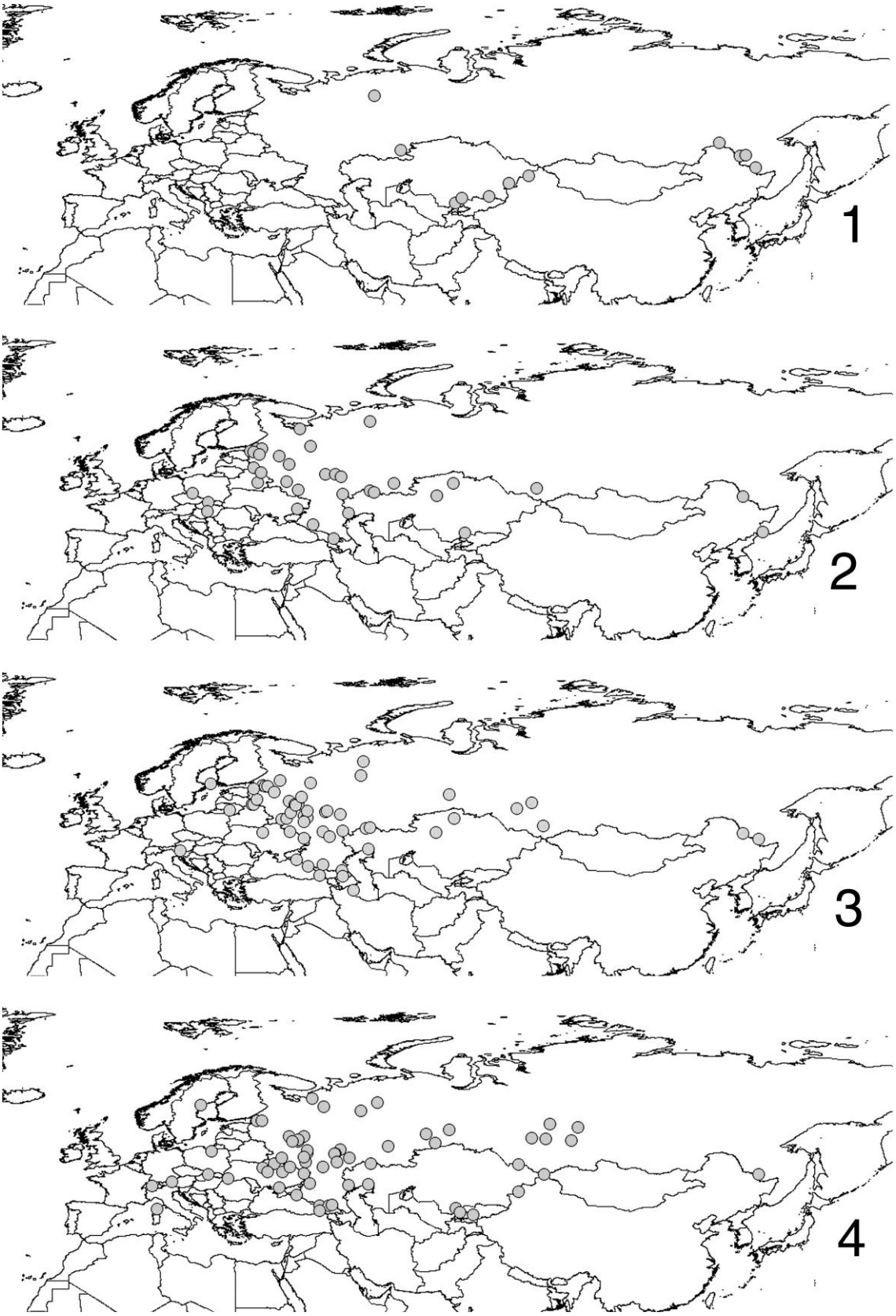


Figure 17. Color forms 1–4 of *Chrysolina polita*.

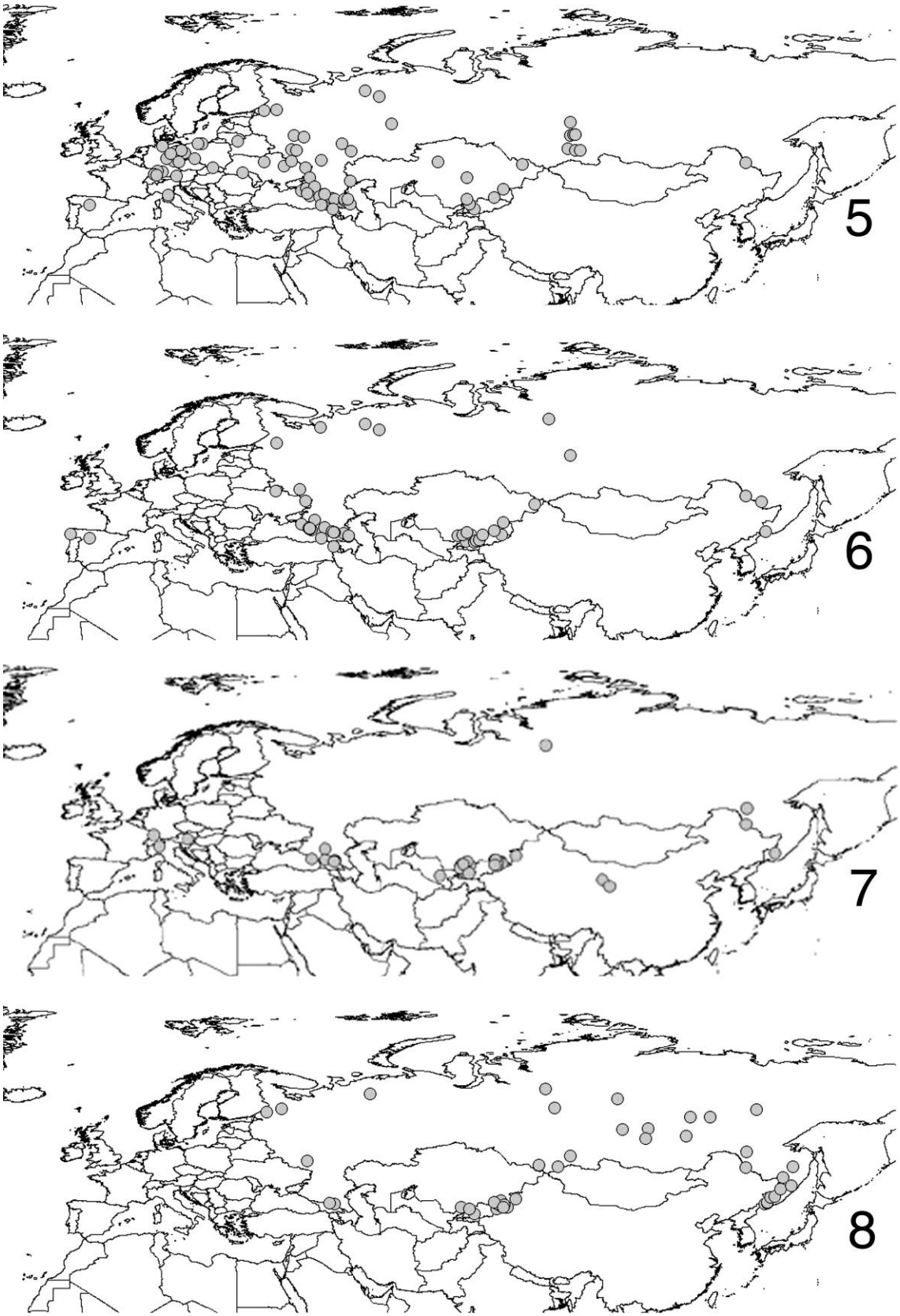


Figure 18. Color forms 5–8 of *Chrysolina polita*.

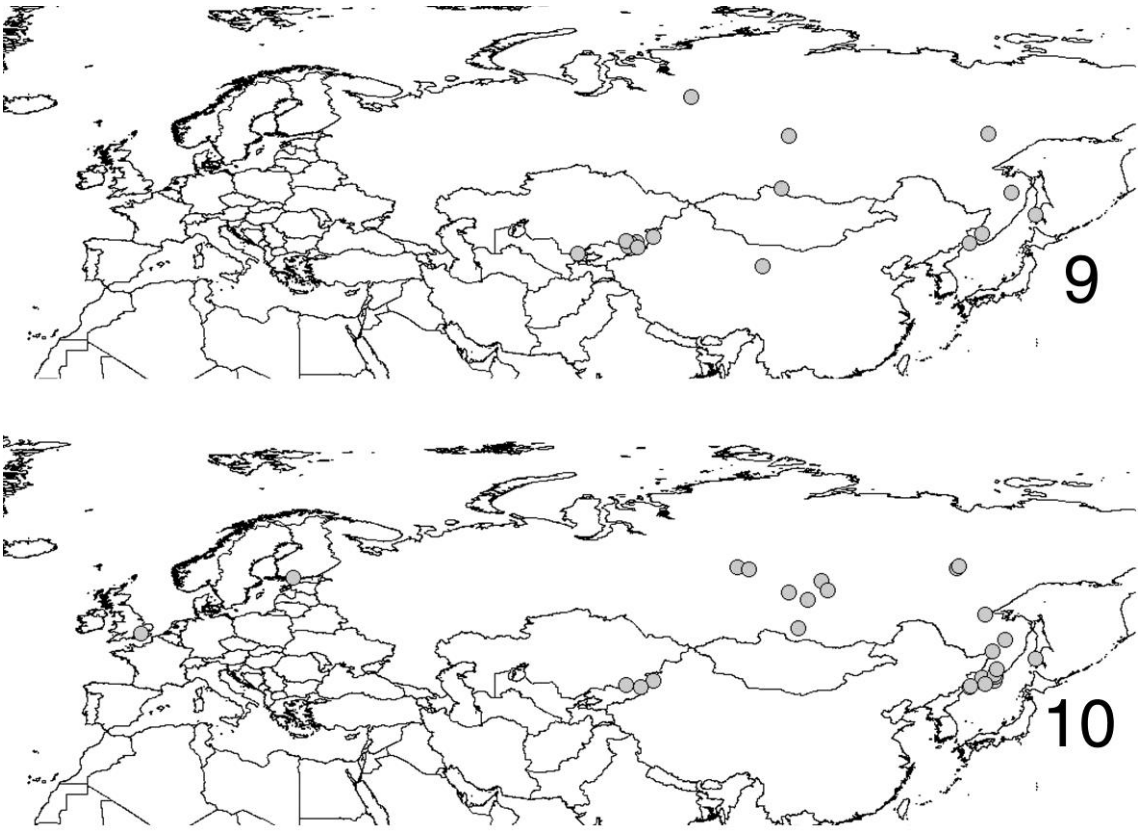


Figure 19. Color forms 9–10 of *Chrysolina polita*.

Two specimens of *Ch. polita* from "Annam. Laos" in HNHM is evidently mislabeled, because this species does not occur in S-E Asia.

Ch. ogloblini was originally described from Armenia. I also examined specimens from the Near East (Syria, Lebanon, Iraq, Turkey). It is a separate species but not a subspecies of *Ch. polita* because it differs in the structure of pronotum and aedeagus (See "Review of the subgenera... Subgenus *Erythrochrysa*").

165. The subspecies *Ch. palmyrensis assurensis* was originally described (Bechyné, 1955b) based on the single specimen, marked as "Typus" (for comparison, in the same publication, *Ch. palmyrensis palmyrensis* was described based on "Typus" and "Paratypes"). This specimen is a holotype (ICZN, 1999, 73.1.1). Thus, another specimen in NMB, labeled as "Lectotype" is a mistake.

166. After the original description (Suzuki, Saitoh, 2011), *Ch. kirigaminensis* differs from *Ch. polita* (including the subspecies *s.str., adamsi, ogloblini*): "in the pronotal structures; i.e., the posterior half of lateral margins of pronotum nearly straight in this new species from Japan but distinctly rounded in *C.* (*Er.*) *polita*". "... this new species is quite different in its body coloration from any of the five color forms known for *C.* (*Er.*) *polita* ". "Head metallic pitchy black; pronotum metallic pitchy black with very faintly dark greenish reflection <...>; scutellum and elytra dark reddish brown".

I examined four topotypes (2 males, 2 females) of *Ch. kirigaminensis* kindly presented by S. Saitoh. Shape of aedeagus (in male) and pronotum in these specimens are within infraspecific variability of *Ch. polita*. However, color of head and pronotum (dark olivaceous) in these

specimens from Honshu is very rare for *Ch. polita*. Among more than 600 specimens of *Ch. polita* from different parts of the area I found only one specimen (from Russian Far East: Amur region) with the color similar to that in the specimens from Honshu. Other Far Eastern specimens represent other color variations. All specimens from Japan have rare dark olivaceous color of head and pronotum. To date, more than 50 specimens are known (Suzuki, Saitoh, 2011; S. Saitoh personal communication). Therefore, I believe *kirigaminensis* to represent valid subspecies of *Ch. polita.*

167. Examination of the syntype (male) of *Chrysolina jeanneli* (*Erythrochrysa* figure 7) permits me to consider this name to be an junior synonym of *Ch. polita*. Because of the *Ch. polita* is not recorded from Yunnan till now (Kippenberg, 2010), I think that the geographical label of this specimen is incorrect. Sprecher-Uebersax, Daccordi (2016) recorded *Ch. jeanneli* from Laos. Based on the total photo of dorsal view of the beetle and figures of aedeagus in Sprecher-Uebersax, Daccordi (2016), I think that this specimen belongs to *Ch. bowringii*.

168. The collection of LSL contains five specimens labeled as "*Chrysomela graminis*". Specimens № 5549 (designated as lectotype by Ge, 2004, in litteris), № 5551, and № 5553 really belong to *Ch. graminis*. Specimens № 5550 (collected in England) and № 5552 (collected in Italy in 1787) do not belong to *Ch. graminis*, but to *Ch. herbacea* according to the recent interpretation (Bechyné, 1950a; Kaszab, 1962; Mohr, 1966b; Brovdij, 1977; Lopatin, 1977, 1986, 2010; Gruev, Tomov, 1986; Warchałowski, 1993, 2003, 2010; Kippenberg, Döberl, 1994; Bieńkowski, 2004a, 2010): coloration (green unicolorous elytra, bluish green pronotum) is atypical for *graminis*; pronotum broadest basally is atypical for *graminis*; pronotum less convex in lateral view than in *graminis*, elytral punctures smaller than in *graminis* and partly arranged in rows at disc, with intervals not wrinkled; elytral epipleura invisible in lateral view in the apical third.

Both species, *graminis* and *herbacea*, inhabited Great Britain in the first half of the 19th century (Stephens, 1831) and now occur there (Marshall, 1979). Stephens (1831), apparently considered *Ch. graminis* under the name *Ch. fulgida* (coloration of head, thorax, and elytra "bright golden-green, the disc, in certain lights, blue; antennae and legs brassy-green, the base of the former sometimes ferruginous beneath"), and he considered *Ch. herbacea* under the name *Ch. graminis* ("the surface entirely of a uniform blue-green; antennae and legs rich metallic green").

With a view to the stability of the zoological nomenclature, it is useful to: 1) consolidate the recent interpretation of the name of *Ch. graminis*, 2) consider specimen № 5550 labeled as *graminis* in the Linnaeus collection (LCL) not belonging to the type series, 3) consider a character of *graminis* indicated by Linnaeus (1758) "antennis <...> concoloribus" inaccurate, because it is more typical of *Ch. herbacea*.

The difference in the color of antennomeres in *graminis* and *herbacea* was noted by Weise (1884a) and Marseul (1886): 2–3 basal antennomeres are usually reddish in *graminis*, and do not differ in color from the following (metallic) antennomeres in *herbacea*. Bechyné (1950a) added the best external distinctive feature in the form of elytral epipleura (in the diagnosis of the subgenus *Euchrysolina* and *Menthastriella*, respectively): epipleura is visible along the entire length in lateral view in *graminis*, not visible in the apical ⅓ in lateral view in *herbacea*.

169. *Ch. graminis schallehni* is known only from the type series, collected in May, 1909 on the Peninsula Sirmione at Garda Lake shore in northern Italy. I studied the type series. These specimens clearly differ from the subspecies *santonici*, inhabiting Austria, Italy, France, and Spain, in body slender (1.8–1.9 X as long as wide), with lateral sides of elytra almost parallel, moderately convex. Besides that, I studied 4 topotypes (from Sirmione) and specimens from different localities

in N Italy (regions Venezia, Friuli, Emilia-Romagna, Piedmont, Lombardy, Tuscany. All of them belongs to the subspecies *santonici*. Therefore, I think, that *schallehni* is not real geographical rasa (= subspecies), but only the result of the "founder effect" – the establishment of a new population by a few original founders (in an extreme case, by a single fertilized female) which carry only a small fraction of the total genetic variation of the parental population. Synonymy of subspecies *santonici* and *schallehni* was suggested before by Ratti (1988), but without examination of the types and any discussion.

170. Collection by Linnaeus (LSL) contains two specimens labeled "*Chrysomela speciosa*". Both correspond to the recent interpretation (Bontems, 1981; Kippenberg, 2010) of *Oreina* (s.str.) *speciosa* (Linnaeus, 1767). One of them, № 7342, according to the label, was collected in 1787, after the publication of the description of the taxon. Another, № 7341, can be considered as a syntype. Therefore, the inclusion of *speciosa* Linnaeus as a subspecies (Bechyné, 1950a) or intrasubspecific "form" in the species *Ch. fastuosa* (Apfelbeck, 1912; Warchałowski, 1993, 2003) is incorrect.

171. The type deposition of *Ch. inexplicabilis* was not indicated in the original description (Brancsik, 1910). The beetles from the collection by Karel Brancsik (1842–1915) were transferred in 1918 to the collection by Eduard Knirsch (1869–1955) (according to Horn, Kahle, 1935–1937). The collection by E. Knirsch is deposited in Field Museum of Natural History, University of Chicago, Chicago, USA; the Palaearctic part of this collection contains the specimens from the collection by K. Brancsik (https://www.fieldmuseum.org/node/5081). However, the curator of the collection, Crystal Maier (personal communication), could not find there the type of *Ch. inexplicabilis*.

Taxon *inexplicabilis* (together with conspecific ones, *biroi* and *jodasi*) differs from nominotypical *Ch. fastuosa fastuosa* by the coloration of dorsal side: dark blue, violetish blue, or violet with blue stripes on elytra (Brancsik, 1910; Csiki, 1953; Bechyné, 1954b). Csiki (1953) noted, that there are no specimens of *Ch. fastuosa fastuosa* in the locations of *inexplicabilis* in Romania and Serbia. However, the known area of the form *inexplicabilis* (Bulgaria, Hungary (Banat), Romania, Serbia, Turkey) completely falls (Kippenberg, 2010) into the range of *Ch. fastuosa fastuosa*. Kippenberg (2010) recorded *inexplicabilis* from Bulgaria, but this contradicts to Gruev, Tomov (1986), which indicated only the nominotypical subspecies for this country.

I have the specimens of the color form *inexplicabilis* from Romania (types of *biroi*, *Fastuolina* figure 6) and Turkey. On the other hand, I have the specimens of the typical color of *Ch. fastuosa* from Romania, Hungary (including Banat, the type locality of *inexplicabilis*), Croatia, Moldova, Slovenia, Montenegro, and Macedonia. There are no other differences of the form *inexplicabilis*, besides the coloration. Thus, the form *inexplicabilis* can not exist as a geographic subspecies. Therefore, I support the view by Bechyné (1950a), Warchałowski (1993) on the intrasubspecific rank of the form *inexplicabilis* (= *jodasi* = *biroi*).

172. Subspecies *Ch. fastuosa ventricosa* is known from Italy, S Spain, and Portugal (Bechyné, 1950a; Kippenberg, 2010). On the other hand, I have at my disposal 16 specimens from French Pyrenees (Haute-Garonne: Luchon), which belong to *Ch. fastuosa fastuosa*.

173. Daccordi (1982c) examined a type specimen of *Chrysomela angolensis* Weise, 1917 in NRS and called it "holotype". However, the holotype was not designated in the original publication

(Weise, 1917), and the author, J. Weise, mentioned body length as follows: "Long. 9–10 mm". That is, there were more than one type specimen, and that deposited in NRS is a syntype.

174. Bechyné (1962) described *Gnathomela glasunovi* based on two females collected on the northern slope of Nuratau ridge, from the Uhum village. The author, J. Bechyné compared the new species with the only known species of the genus so far, *G. dolens*. Among other features, Bechyné (1962) noted: "<...> dessus plus mat, surtout sur les élytres" [in comparison with the ventral side, *comm. AB*], "<...> le thorax offre un calus latéral considérablement convexe, séparé du disque par une large dépression parcourant toute sa longueur, <...>", "<...> le prostethium est absolument lisse et luisant (à sculpture subrugueuse sur le fond mat chez l'autre espèce)". I examined holotype and paratype of *G. glasunovi* (both are females) and additional male from the northern slope of Nuratau ridge (Sentob village, 10 km N-W from Uhum village, the type locality of *G. glasunovi*). Examined male specimen corresponds to the original description of *G. glasunovi*. It can be ragarded as topotype.

Lopatin (1972) did not have the type of *G. glasunovi* at his disposal, misinterpreted the characters in the original description of the latter (see below) and described *G. valida nuratavica* from the southern slope of Nuratau ridge. Lopatin (1972) noted that *G. glasunovi*, unlike the new taxon *nuratavica*, has "a reverse combination of the features", "pronotum completely smooth, with convex lateral callus, and elytra mat". In fact, the original description of *G. glasunovi* does not contain any information about the pronotal punctation. Bechyné (1962) described a relief of *prostethium*, but not of pronotum. Lopatin (1972) mistakenly identified *prosthetium* with pronotum. Because of that, Lopatin (1977, 2010) noted for *G. glasunovi* that "pronotum completely smooth and shining". This does not match the holotype of *G. glasunovi*. On the other hand, *prosthetium* = prosternum (Zombori, Steinmann, 1999). Bechyné (1962) called pronotum as "thorax". In another publication (Bechyné, 1952a) he used the term *prostethium* in the meaning of the prosternum: "Prosternum wenigstens an der Basis mit einem Rudiment von **Prostethial**furche (= Furche, die die Episternen von den Prosternalflügeln abtrennt) ... Tribus Chrysolinini Bech. " Thus, it is more correct to treat *prostethium* as a prothoracic hypomeron.

Examination of the holotype (male) of *G. valida nuratavica* (*Gnathomela* figure 19) showed its conspecificity to the holotype and the topotype (from the Sentob vill.) of *G. glasunovi* and its correspondence to the original description of the latter. Although Lopatin (1972) noted for *G. valida nuratavica*: "pronotum mat" and "elytra shining", it does not correspond to the holotype of this taxon. In fact, the holotype of *G. valida nuratavica* has pronotum and elytra more or less equally shining, alike the male from Sentob vill. However, pronotum and elytra in the holotype of *G. valida nuratavica* are some more shining that in holotype of *G. glasunovi*. This only difference can be the difference between a male and a female.

With regard to the relief of prostethium (prothoracic hypomeron), available male (topotype of *glasunovi*) has prostethium shining, with relief obsolete. This character distinguishes *G. glasunovi* from *G. dolens*. The latter has prostethium mat, with large wrinkles along lateral margin (as Bechyné, 1962 noted).

Most *Gnathomela* taxa are very locally distributed and mostly allopatric species and subspecies (Lopatin, 2010). Seven out of nine known species inhabit only any one ridge or closely spaced ridges in the mountains of Central Asia. Up to the present, only *glasunovi* and *valida nuratavica* are known from Nuratau ridge. The above arguments indicate that they are conspecific.

175. The genus *Pachygnatha* [subsequently replaced to *Gnathomela*], with the single species *dolens*, was originally (Weise, 1892d) separated from *Chrysomela* [*Chrysolina* in recent

interpretation] as follows: "Sie unterscheidet sich ausserdem von übrigen Chrysomelen durch die ungemein kurze, in der Mitte tief ausgebuchtete Oberlippe und die grossen vortretenden Mandibeln mit weniger stumpfen und breiten Endzähnen". Later, Bechyné (1962), Lopatin (1972, 1990a) added nine more taxa of the specific rank to the genus *Gnathomela*. The taxon *Gnathomela* with the same diagnostical features (labrum very short, with a deep incision in the middle; mandibulae large, protruding) was considered to be a separate genus (Lopatin, 1977, 2010; Lopatin, Kulenova, 1986; Warchałowski, 2010). Daccordi (1994) lowered the rank of *Gnathomela* to the subgenus within the genus *Chrysolina*, without explaining this change. Kippenberg (2010) used this name as a subgenus *Chrysolina* (*Gnathomela*).

Having studied the material on all *Gnathomela* species, I found that only the type species, *G. dolens* has mandibulae larger and emargination of labrum deeper than the respective in *Chrysolina*. The other *Gnathomela* species do not share these characters. On the other hand, all *Gnathomela* species have many common diagnostic features (see Diagnosis of *Gnathomela*) and are well separated from other *Chrysolina* subgenera. Thus, the subgeneric rank of *Gnathomela* is confirmed.

176. *Chrysomela subfastuosa* Motschulsky, 1860a was subsequently considered to be an aberration of *Ch. coerulans* by Weise (1916), Warchałowski (1993) or junior synonym of *Ch. coerulans splendorifera* by Bieńkowski (2001), Kippenberg (2010). Having examined a type specimen of *Ch. subfastuosa*, I came to conclusion about the conspecificity of *Ch. subfastuosa* and *Ch. fastuosa fastuosa*. The type specimen of *Ch. subfastuosa* corresponds to all features of *Ch. fastuosa* , including the presence of denticles on 4th tarsomere, characteristic coloration: body green with elytra mostly golden green, with bluish spots on the pronotal base laterally, bluish suture, lateral margin and longitudinal discal stripes on elytra, bluish lateral sides of meso- and metasternum, and characteristic aedeagus structure (*Fastuolina* figure 8).

177. I examined one syntype of *Dlochrysa fastuosa andorrensis* and 2 more specimens (male and female) of *Ch. fastuosa*, collected in the Pyrenees (Spain: Prov. Lérida, Capdella) not far from type locality of *D. fastuosa andorrensis* (Andorra: Massana) and identified in 1951 by the author of this subspecies, J. Bechyné, as "*Dlochrysa fastuosa andorrensis*". All these specimens correspond to *Ch. fastuosa fastuosa* by all characters, including the shape and size of the body, and the development of denticles on 4th tarsomere.

178. I compared the type of *ohoi* (by the photo) and original description of this taxon with available specimens of *nikkoensis* from Japan (the latter was described from Japan) and China. I came to conclusion on the conspecificity of *ohoi* and *nikkoensis*. Coloration of dorsal side in *ohoi* was originally described as "bronzy black, with strong cupreous or brassy shimmer" (Chûjô, 1958), in the photo the type specimen looks like black, shiny. Coloration of dorsal side in *nikkoensis* was originally described as "black or dark blue" (Jacoby, 1885). Available specimens of *nikkoensis* are blackish blue, blackish violet, or blackish brassy dorsally. The density of the puncturation in the elytral rows is not indicated in the original description of *ohoi* Chûjô, 1958. Very dense puncturation in the elytral rows and the distances between punctures not greater than their diameter are shown in the *ohoi* figure by Chûjô (1958). Dense puncturation in the elytral rows is visible in the photo of *ohoi* type specimen. Densely placed elytral punctures (25–32 ones in the 5th row) present in the available specimens of *nikkoensis.*

179. Currently *Ch. difficilis* is divided into three subspecies, occupying different parts of the range as follows (Fig. 20).

Figure 20. Characters of the subspecies of *Ch. difficilis* in literature sources.

Ch. difficilis difficilis		*Ch. difficilis ussuriensis*		*Ch. difficilis yezoensis*		References
characters	area	characters	area	characters	area	
-	-	-	-	violet to blackish blue; length 7.0–8.5 mm	Sakhalin, Hokkaido	Takizawa, 1970
-	-	bronze, blackish bronze, blackish coppery; abdominal sternites with apical margin rufous; length 6.0–7.6 mm	S Primorsky Krai	violet, dark-violet; abdominal sternites with apical margin not rufous; length 6.6–7.8 mm	Sakhalin, Japan	Medvedev, 1992a
smaller (5.5–6.0 mm), violet tinge on upper side distinct	Altai, Sayans	larger (6.0–7.5 mm), body moderately elongate	basin of Amur	large (8.0–9.0 mm), more strongly elongate	N-E China, Korea, Sakhalin, Japan	Warchałowski, 2010
upper side dark bronze; length 6.0–6.5 mm	E Kazakhstan, Altai, S Siberia	-	-	-	-	Lopatin, 2010

Having examined the specimens from different regions, I came to conclusion: **1)** clear geographical differences in size and shape of the body are absent; **2)** there is some geographical difference in the coloration of the dorsum. Specimens from Sakhalin, Japan, Korea, N-E China are violet, purplish violet, or blackish violet; those from Amur reg. and Primorsky Krai are mostly blackish bronze or blackish violet; those from Altai and Khakassia are bronze, violet, or purplish violet. But there are specimens that do not differ in coloration: a) purplish violet ones from Altai and Sakhalin, b) blackish blue ones from Transbaikalia and Korea, c) blackish violet ones from Japan, Mongolia, and Transbaikalia; **3)** coloration of abdominal sternites is similar in all specimens, blackish metallic; **4)** coloration of the articular membrane between abdominal sternites (has the appearance of a stripe at the apex of sternite) is rufous or black in different specimens, but does not connected with the region. Thus, at present there are no grounds for distinguishing subspecies within *Ch. difficilis*.

180. The taxa *didymata* and *syriaca* are considered to be separate species (Dahlgren, 1984), or subspecies of the same species (Bechyné, 1949b; Warchałowski, 2003). These two taxa have similar external characters and almost similar aedeagus structure. However, the proportions of the latter are different: 1) aedeagus is less extended at apex and with even sides before this extension in *didymata*, 2) aedeagus is more extended at apex and usually with uneven sides, looks like undulate before this extension in *syriaca*. Differences, mentioned by Bechyné (1949b), in the head

puncturation: "Capite tenuissime punctulato (clypeo densius)" in *didymata*; and "Capite laevi, solum clypeo tenuiter punctulato" in *syriaca*, and in the shape of pronotal anterior angles: "Pronoti angulis anterioribus minus inclinatis" in *syriaca*, do not confirmed in the material being at my disposal. Coloration of dorsal side is usually blue or bluish violet, rarely green or olive copper (in some specimens from Turkey) in *dydimata*; it is always coppery or olive copper in *syriaca*.

Subspecies *didymata elongatior* (type localities "Libanon: Jounich", "Syrien: Aleppo"), according to the original description (Bechyné, 1949b), is bluish violet dorsally, and differs from both, *dydimata* and *syriaca*, by the elongated body (as in *Ch. quadrigemina*) and stronger elytral puncturation. In fact, syntype of *elongatior* ("Jounich, Liban"), examined by me, is absolutely identical externally with the European specimens of *didymata*, including similar body shape and puncturation in rows and intervals of elytra. Nine additional specimens, topotypes of *elongatior* ("Syrien Aleppo") in NHMW are also absolutely identical with *didymata* in both, the external characters and aedeagus structure. Thus, *elongatior* is a synonym of *didymata*.

Ch. didymata inhabits Syria and Lebanon; and *Ch. syriaca* occurs in Israel (type locality "Haifa"). Does *syriaca* occur in Syria, sympatric with *didymata*? – this question remains open. Old museum label "Syria" can refer to the territory of Israel. Despite the fact that it is still unknown whether sympatric or allopatric *didymata* and *syriaca*, I consider them to be separate species due to distinct differences in the shape of the aedeagus (see above). Most specimens of *didymata* from Turkey. do not differ in color from *syriaca* (olive copper), but males correspond to *didymata* based on the aedeagus structure.

181. Weise (1916) erroneously pointed "1892" as a date of the original publication of the subgeneric name *Hypericia*. Really, "Faune des Coléoptères du bassin de la Seine, V" by L. Bedel was issued in 7 parts from 1889 to 1901. The pages 229–276, including the description of *Chrysomela* (*Hypericia*), were published in 1899.

182. Kippenberg, Döberl (1994) noted that *Ch. geminata* "östlich bis Schlesien nachgewiesen". However, this species is distributed in the Ukraine (Brovdij, 1977), Byelarus (Lopatin, Nesterova, 2005), Georgia (Seperteladze, 1966), and European Russia (specimens from different regions at my disposal).

183. I examined the lectotype (male) of *Ch. nikinoja* (*Hypericia* figures 23, 28–30, 33) and available specimens of *Ch. difficilis* and decided that they are conspecific. Original description of *Ch. nikinoja* is rather detailed. But, after the examination of the type specimen of *nikinoja*, I found a slight difference from its original description: 1) last maxillary palpomere as wide as penultimate one; 2) most of the large punctures, separating pronotal lateral callus in anterior ⅔, are separated from each other, only few punctures merged with each other, 3) anterior corners of pronotum are rectangular, posterior ones are hardly more than 90 °, 4) scutellum smooth, covered with fine punctures basally, 5) elytral intervals covered by punctures as dense as punctures at pronotal disc, but larger than those.

According to the original description (Bechyné, 1952a), the subspecies *Ch. nikinoja exgeminata* differs from the nominotypical one as follows: "Die Oberseite <...> ist metallisch violett, sehr stark glänzend, Körperform mehr länglich. Die Punktierung des Halsschildes ist feiner (nur so stark als auf den Zwischenräumen der Flügeldecken) aber die sekundäre (in Reihen gestellte) Elytralpunktierung ist gröber als bei der Stammform". According to the original description, body is 8.5 mm long, but available type specimens is 7.3 mm long.

Comments

I compared the types of *Ch. nikinoja nikinoja* and *Ch. nikinoja exgeminata* (*Hypericia* figure 34) and did not find almost any differences, including the mentioned by Bechyné (1952a). The only difference between the types of *exgeminata* and *nikinoja* is a slightly stronger transverse depression on the 5th abdominal sternite immediately behind the mid-length in the former. This depression, on the whole, is weak. Therefore, I believe *nikinoja nikinoja* and *nikinoja exgeminata* to belong to the same taxon.

184. The original description of *Ch. pubitarsis* is rather brief and devoid of figures (Bechyné,1950a). The author, J. Bechyné originally included this species in the subgenus *Allohypericia* and noted that it differs from all other members of the subgenus in question by the tarsi which are wholly pubescent beneath in both sexes. I had no possibility to borrow the type of *Ch. pubitarsis*. However, I examined (Bieńkowski, 2019) one female, which was determined by the author, J. Bechyné, as "*Ch. pubitarsis*". I found this specimen to be conspecific with *Ch. difficilis*. However, this specimen was collected not quite in the same region as the type of *pubitarsis* (*Ch. pubitarsis* was described from Beijing, and the available specimen, examined by Bechyné and me, was collected in Manchuria, 180 km east of Harbin).

Mikhailov (2021) studied the type, male of *Ch. pubitarsis* and confirmed that this taxon belongs to the subgenus *Allohypericia*. Mikhailov (2021) designated it as a lectotype. This is incorrect. Bechyné (1950a) certainly designated this specimen as "type" (not a type series as is often found in the same publication). The original description includes the characters of other specimens (length 6-7.5 mm; there was also a female with the described characters). In such a case, other specimens, if they exist, should be considered as paratypes.

Mikhailov (2021) found that the holotype of *Ch. pubitarsis* has certain differences from *Ch. aeruginosa*, in particular, pygidium with impression in basal half only, aedeagus with sharp apical denticles, prothoracic hypomera slightly convex, outer side almost flat and shagreened with impression at basal ¼. But at the same time he notes that the specimen is not entirely mature. Therefore, the characters can be skewed. Characters of the female, mentioned by Bechyné (1950a), namely tarsomeres 1–3 wholly pubescent beneath, may refer to another species, especially since the author identified the female of *Ch. dificilis* as *Ch. pubitarsis*. Until further data, I include *Ch. pubitarsis* in the subgenus *Allohypericia* as a species of uncertain position.

185. Only one species of the subgenus *Hypericia* was known from Taiwan till now (Chûjô, 1958; Yang, 2014) – *Ch. ohoi* (I consider it to be a synonym of *Ch. nikkoensis*). One available female (Taiwan: Chiayi, Alishan) differs from *nikkoensis* (and *ohoi*) by sparse puncturation in elytral row: (18 punctures 5th row, 20 punctures in 9th row). Externally, it is similar with the specimens of *Ch. gracilis* from China.

186. Bechyné (1949b, 1950a) considered *Chrysolina daghestanica* to be an East Caucasian subspecies of *Ch. hyperici*. The characters of *Ch. daghestanica* mentioned by the cited author (and one available specimen identified by J. Bechyné as "*hyperici daghestanica*" in ZSM) reveal an erroneous interpretation of the taxon. Based on the examination of the syntype of *Ch. daghestanica* and additional material, I can conclude that *Ch. daghestanica* and *Ch. cuprina* are conspecific. The syntype of *Ch. daghestanica* (*Hypericia* figure 37) is a female 6.5 mm long, dorsum purplish red with golden green scutellum, venter dark blue, legs with aeneous sheen, 1st and 2nd antennomeres reddish (other antennomeres missing); lateral sides of pronotum uniformly arcuately rounded, lateral grooves at base of pronotum deep, extending to ⅓ its length; rows 4, 5, 8, and 9 on elytra

comprising 20, 21, 24, and 25 punctures, respectively; wings normally developed, longer than elytra. The coloration of the other specimens of *Ch. cuprina* from the Caucasus is either the same as in the type of *daghestanica*, or with a unicolorous dorsum: blue, blue-green, copper-green, or purple.

187. The record of *Ch. quadrigemina* from Azerbaijan (Mirzoeva, 1988) is doubtful. According to recent data, the species inhabits W Europe and N Africa (Warchałowski, 1993). A specimen (male) in ZIN, identified by Mirzoeva as "*quadrigemina*" and examined by me, really belongs to *Ch. hyperici*.

188. Among the specimens from E. Suffrian collection kindly sent me by K. Schneider, I found two type specimens of *Ch. quadrigemina*, both are males. One of them have been designated by G. Dahlgren as lectotype (*Hypericia* figures 17, 25). I designate the second as a paralectotype. Both specimens correspond to the recent interpretation of *Ch. quadrigemina* by Bechyné (1949b) and Dahlgren (1984). Lectotype is golden green from above, punctures in elytral rows violet, head and pronotum sericeous shining, elytra very shining, elytral rows 4 and 5 consist of 15 and 18 punctures respectively. Elytral intervals covered by dense punctures which larger than those at pronotal disc and only slightly smaller than those in pronotal lateral impressions. Last abdominal sternite with weak broad triangular impression in apical ⅔, which narrowly prolonged to anterior margin. Paralectotype is blue from above, pronotal disc with violet reflection, elytral rows 4 and 5 consist each of 13 punctures. Elytral intervals covered by dense punctures distinctly finer than those in pronotal impressions.

189. Mohr (1966a) considered *discriminata* and *infuscipes* to be conspecific based on the figure of aedeagus of the type specimen of *discriminata* in the paper by Kontkanen (1959). However, Mohr (1966a) did not indicate whether he studied the type of *infuscipes*. Medvedev (1979b) examined the types of both, *discriminata* and *infuscipes*, came to conclusion about their conspecificity. I agree with him. Bourdonné (2012) does not comment on the above conclusions and considers *infuscipes* as a valid species, which is closer in aedeagus structure to *mongolensis* than to *discriminata*. This misunderstanding is based on specimens of "*infuscipes*" from "northern" and central Mongolia (Central Aimak, Bulgan Aimak, Uburchangaj Aimak) (Bourdonné, 2012). In fact, the type locality of *infuscipes* is N-E China ("Changaj") (Weise, 1890a, 1916). The taxon described by Bourdonné (2012) under the name "*infuscipes*" does not occur in N-E China. Only *Ch. discriminata* (= *infuscipes* Weise, nec Bourdonné) inhabits N-E China (based on the map in the paper by Voronova, 1985).

190. Bourdonné (2012) indicated from Central Mongolia two species, which differ by average body size (insignificantly), proportion of antennomeres 1–3, elytral puncturation, and aedeagus structure, namely *Ch. mongolensis* and a species erroneously identified by Bourdonné (2012) as *Ch. infuscipes* (see Comm. 189). J.-C. Bourdonné studied aedeagi of 3 males of *Ch. mongolensis* (type specimens) and 5 males of "*Ch. infuscipes*" (9 males were dissected).

I examined aedeagi of 72 males, including numerous series from Central and Uverkhangay Aimaks (the latter is a type locality of *Ch. mongolensis*). The aedeagus structure of these beetles proved to be very variable (*Hypochalcoidea* figures 9, 10). I identified the extreme forms by the aedeagus structure as *Ch. mongolensis* and "*infuscipes*" sensu Bourdonné (not real *infuscipes*!). There are numerous intermediate forms between these extreme ones, including those from the same localities. I did not find the differences between *mongolensis* and "*infuscipes*" sensu Bourdonné by

the external structure, which were noted by Bourdonné (2012). Therefore, I believe that there is one species, *Ch. mongolensis* with a variable shape of aedeagus in Central Mongolia.

191. Bourdonné (2007) designated a lectotype of *Ch. ordinata* from the materials of MNHN. This specimens is arranged with the original label by F. Gebler "*Ch.: ordinata*" and no more original labels. The designation of this specimen as a lectotype can not be accepted for several reasons: 1) there is no evidence of its belonging to the specimens originally studied by Gebler (1823) for the description of the species; 2) there is no reliable data on the origin of this specimen from the type locality. A label "Barnaul, Sibérie, Russie" was added by Bourdonné (2007). We know that *Ch. ordinata*, originally described from Barnaul, was subsequently found by Gebler (1848) in other places ("Smeinogorsk, Loktewsk"); 3) the specimen, selected by J.-C. Bourdonné, is a female, which is not very good for this group of species. The best character to distinguish of the closely related species of the respective group is male aedeagus, in particular, to distinguish *Ch. ordinata* and *Ch. tatianae*.

I offer to designate a male specimen from ZMUH as a lectotype of *Ch. ordinata* (*Jeanclaudia* figures 1, 8). According to the labels, this specimen was obtained by Mannerheim from Gebler, it was collected in Barnaul, and supplied with the bottom label "*ordinata* Steven" (Gebler, 1823 originally entitled his species as "*Chrysomela ordinata* Steveni"). This change of the lectotype does not affect the taxonomy and nomenclature, and leads to its stability, since the understanding of the species remains the same (Bourdonné, 2007; Lopatin, Mikhailov, 2010; Mikhailov, 2009; Mikhailov, 2002b; Bieńkowski, 2011; Bieńkowski, 2004a; Medvedev, Dubeshko, 1992; Lopatin, 1970b, 2010; Mohr, 1966a).

192. The name *Liomela* was originally proposed for the genus (Weise, 1912) with one species *L. splendida*. Weise (1912) noted that the anterior coxal cavities are open, and elytral epipleura are glabrous, without setae (a character distinguishing this genus from *Chrysolina*). Despite that, Bechyné (1958) considered *Liomela* as a subgenus of the genus *Chrysolina* and senior synonym of the subgenus *Ghesquiereita*. Daccordi (1976a) returned the status of a separate genus *Liomela*. This author discussed in detail the reduction of setae on elytral epipleura and described one more new species of *Liomela*. Daccordi (1976a) believed that *Chrysolina* is characterized by numerous and well-marked setae on elytral epipleura. He found in *Liomela* the epipleura not completely glabrous, but with 4–5 setiferous pores. Daccordi (1976a) suggested an additional character of *Liomela*, distinguishing it from all African Chrysomelinae and confirming the generic status of the taxon in question: flagellum of male aedeagus is folded in half at the apical orifice so that the apex of flagellum is directed again into the interior of the aedeagus. Subsequently, Daccordi (1994) again included *Liomela* in the genus *Chrysolina* as a subgenus other than *Ghesquiereita*, because the reduction of setae on the epipleura up to their complete disappearance was found in different groups of the genus *Chrysolina*, but the presence of setae together with opened anterior coxal cavities was found in a number of genera, including unrelated to *Chrysolina*.

193. There are lectotypes designations for intraspecific taxa within *Chrysolina exanthematica* (Wiedemann, 1821).

Chrysomela speculifera Redtenbacher, lectotype, designated here, with labels: "Alte Sammlg. Kaschmir", "Hügel 699", "*Speculifera* Redt. Kaschmir" [handwritten by L. Redtenbacher], "Lectotype *Chrysomela speculifera* Redtenbacher, 1848. Bieńkowski design. 2005" [red], "*Chrysolina exanthematica exanthematica* Wied. Bieńkowski det. 2005": 1 male (NHMW).

Lithoptera subaenea Motschulsky, lectotype, designated here, with labels: "Amur" [red], "type", "*Lithoptera subaenea* Motsch. Daur. m. fl Amur", "Lectotype *Lithoptera subaenea* Motschulsky, 1860. Bieńkowski design. 2005" [red], "*Chrysolina exanthematica exanthematica* Wied. Bieńkowski det. 2005": 1 male (ZMMU) (*Lithopteroides* figure 7).

Lithoptera nigrogemmata Motschulsky, lectotype, designated here, with labels: small pink (unreadable), "*Lithoptera nigrogemmata* Motsch. Daur. m. Amur", "Lectotype *Lithoptera nigrogemmata* Motschulsky, 1860. Bieńkowski design. 2005" [red], "*Chrysolina exanthematica gemmifera* Motsch. Bieńkowski det. 2005": 1 female (ZMMU); paralectotype with labels: "Amur" [red], "Paralectotype *Lithoptera nigrogemmata* Motschulsky, 1860. Bieńkowski design. 2005" [red], "*Chrysolina exanthematica gemmifera* Motsch. Bieńkowski det. 2005": 1 female (ZMMU); paralectotype with labels: "Nertsch." [= Nerchinsk, red], "Paralectotype *Lithoptera nigrogemmata* Motschulsky, 1860. Bieńkowski design. 2005" [red], "*Chrysolina exanthematica gemmifera* Motsch. Bieńkowski det. 2005": 1 female (ZMMU).

Chrysomela guttifera var. *sericata* Jacobson, lectotype, designated here, with labels: golden circle, "Забайкалье. Ингода. Бурятскій Миръ. 3.VII.1898. Г.Суворовъ", "*Chr. guttifera* v. *sericata* Jac. G.Jacobson det.", "Lectotype *Chrysomela guttifera* var. *sericata* Jacobson, 1901. Bieńkowski design. 2005" [red], "*Chrysolina exanthematica gemmifera* Motsch. Bieńkowski det. 2005": 1 male (ZIN); paralectotypes with labels: golden circle, "Забайкалье. Ингода. Бурятскій Миръ. 3.VII.1898. Г.Суворовъ", "*Chr. guttifera* v. *sericata* Jac. Typ G. Suvorov. det.", "Paralectotype *Chrysomela guttifera* var. *sericata* Jacobson, 1901. Bieńkowski design. 2005" [red], "*Chrysolina exanthematica gemmifera* Motsch. Bieńkowski det. 2005": 2 females (ZIN).

Lithoptera gemmifera Motschulsky, lectotype, designated here, with labels: "Verhneudinsk" [pink], "*Lithoptera gemmifera* Motsch. Daur. mer.", "Lectotype *Lithoptera gemmifera* Motschulsky, 1860. Bieńkowski design. 2005" [red], "*Chrysolina exanthematica gemmifera* Motsch. Bieńkowski det. 2005": 1 female (ZMMU); paralectotypes with original label "Verhneudinsk" [pink] and my "Paralectotype..." and identification labels similar to that under lectotype: 3 females (ZMMU); paralectotypes with original label "Nertsch." [=Nerchinsk, pink] and my "Paralectotype..." and identification labels similar to that under lectotype: 1 male, 1 female (ZMMU); paralectotype with original label "Transbai" [=Transbaikalia, pink] and my "Paralectotype..." and identification labels similar to that under lectotype: 1 female (ZMMU).

Lithoptera guttifera Motschulsky, lectotype, designated here, with labels: "Nertschinsk", "*Lithoptera guttifera* Motsch. Daur. mer.", "Lectotype *Lithoptera guttifera* Motschulsky, 1860. Bieńkowski design. 2005" [red], "*Chrysolina exanthematica gemmifera* Motsch. Bieńkowski det. 2005": 1 male (ZMMU) (*Lithopteroides* figure 8).

194. Two morphologically very close species occur in the Caucasus. They are known under the names *Ch. porphyrea* and *Ch. differens* (= *trapezicollis*). A reliable distinction between them is a structure of the aedeagus. According to Kippenberg (2012c), *Ch. porphyrea* inhabits the northern part of the Greater Caucasus to Abkhazia in the southeast; *Ch. differens* inhabits the Greater Caucasus to the south of the Krasnodar Territory (env. Sochi) in the northeast, as well as the Lesser Caucasus (Georgia, Armenia) and N-E Turkey.

Chrysomela porphyrea was described by Faldermann (1837) based on the material collected by Russian botanist A.I. Shovitch (? – 1830) in 1829 during the travel in Transcaucasia. Shovitch's route was the following: Tabriz (N Iran) – Iranian Azerbaijan ("Aderbijan", N-W Iran) – Karabakh (Azerbaijan) – eastern Armenia ("Russian Armenia") – Tbilisi (Georgia).

Original description of *Ch. porphyrea* does not contain an exact information on the type locality. It was included in the work "Fauna Entomologica Trans-caucasica. 2". The species was

described based on the series of the specimens, because the description includes variability in body size: "Longit. 2 ½– 3 1/5 lin. Lat. 2 – 2 ½ lin." (Faldermann, 1837). The pronotum was originally described as follows: "lateribus fere rectis".

Beetles from the collection by F. Faldermann were deposited in MNHN, ZIN, and ZMMU (Horn, Kahle, 1935–1937).

Collection of MNHN contains one female of *Ch. porphyrea*, which was erroneously considered as "holotype" by Kippenberg (2012) (see Comm. 109). This specimen is inconvenient to clarify the understanding of *Ch. porphyrea* because this species belongs to the group of taxa, which distinguish from each other mostly in male aedeagus. Besides that, this specimen is not supplied with any original (or historical) information about the collection locality or belonging to the type series.

Collection by V.I. Motschulsky in ZMMU contains two specimens, male and female. The male is supplied with the labels "type" and "*Colaphoptera porphyrea* Fald. Armenia". These labels were handwritten by V.I. Motschulsky, which, obviously, removed and replaced the original labels.

Collection of ZMUH contains one male, labeled "Persia" and "*Porphyrea* Falderm.", and obtained (as noted on the labels) by C. Mannerheim directly from F. Faldermann.

The specimens from ZMMU and ZMUH have pronotum broadest basally, with converging forward, slightly rounded lateral sides. For the establishment of the correct understanding of the name *Ch. porphyrea* I designate here a male labeled "*Colaphoptera porphyrea* Fald. Armenia" (ZMMU) as a lectotype (*Lopatinica* figure 1–4). The males from both ZMMU and ZMUH have aedeagus similar to *Ch. differens* (=*trapezicollis*), but not to recent interpretation (see above) of *Ch. porphyrea*. However, only one from the pair of species under consideration occurs in N Iran, Armenia, and E Georgia, where Shovitch collected the type series. It is *Ch. porphyrea* (= *differens* =*trapezicollis*). The recent interpretation of *Ch. porphyrea* is incorrect, it is *Ch. porphyrea* auct., nec Faldermann.

I tried to see how this confusion with the name *Ch. porphyrea* could arise.

The next publication after the original description of *Ch. porphyrea* was the work by Fairmaire (1865). This author erroneously considered *Ch. porphyrea* to be senior synonym of *Chrysomela cupreopunctata* Reiche et Saulcy, prepared a diagnosis, which really belongs to *Ch. sahlbergii* (=*cupreopunctata*), but not to *Ch. porphyrea*. Because of this error Fairmaire (1865) added Syria and Asia Minor to the range of *Ch. porphyrea*.

Weise (1882) noted on the mistake by Fairmaire (1865). He correctly suggested that *Ch. porphyrea* is externally similar to *Ch. rufa*, correctly noted: "prothorace <...> lateribus fere rectis apicem versus leniter angustatis" and, based on the material collected by Leder, noted the range of *Ch. porphyrea*: "Surami-Gebirge" (the mountains forming the connection between the Greater and Lesser Caucasus, Central Georgia). According to recent data, only *Ch. differens* occurs there.

Marseul (1886) repeated the range of *Ch. porphyrea* after Weise (1882), prepared a detailed description and noted on the pronotal lateral sides: "côtés droits, et présentant une disposition un peu analogue à celle du groupe des trapézoides".

Weise (1892b) included *Ch. porphyrea* in the key to Caucasian *Chrysolina* species based on the materials collected by Rost mostly in Abkhazia. Weise (1892b) separated *Ch. porphyrea* from closely related species based on the absence of pronotal lateral furrow in the former. This work by Weise (1892b) does not include special characters to attribute the species as *Ch. differens* or *Ch. porphyrea* auct. nec Fald. Both taxa occur in Abkhazia.

Franz (1952) described a new species *Ch. differens* (from "Swanetien" and "Prov. Kuban: Laba Minor") and pointed out that this species can be distinctly distinguished [from *Ch. porphyrea* auct. nec Fald., comm. AB] only by male aedeagus. Franz (1952) was the first who published

aedeagus figures for both, the type of *Ch. differens* and another male from N Caucasus (from "Circassien"), identified by him as "*Ch. porphyrea*" in G. Kraatz collection (DEI). An error in the understanding of *Ch. porphyrea* and in its distribution in recent literature begins from here. All subsequent authors considered *Ch. porphyrea* sensu Franz (1952). As a comparable specimen of *Ch. porphyrea* Franz (1952) used a male from the region in which the real *Ch. porphyrea* Fald. practically does not occur. Thus, *porphyrea* auct. nec Fald. = *porphyrea* sensu Franz, 1952, nec Fald. The name *Ch. differens* was originally based on two syntypes, male from Svaneti (Georgia, Greater Caucasus) [it is conspecific with my lectotype of *Ch. porphyrea*], and female from Malaya Laba river valley (Russia, Krasnodar Krai) [it is more likely to be *Ch. porphyrea* sensu Franz, 1952, although a separate female can not be identified for sure].

Bechyné (1952a) described from W Georgia and Adygea a new species *Ch. trapezicollis* (including three subspecies) in which "Oedeagusspitze mit einem Mittelzahn versehen". It was the same as *Ch. differens*, which, in his words, was unknown to him in nature. Besides that, Bechyné (1952a) noted "Ende des Oedeagus pentagonal" for *porphyrea* sensu Franz, 1952. He also first establishes the actual difference of the species in question by the shape of the pronotum: for *porphyrea* sensu Franz, 1952: "Halsschild mit fast parallelen oder gerundeten, schwach nach vorne konvergierenden Seiten"; and for *trapezicollis*: "Halsschild rein trapeziformig, mit geraden und nach vorne sehr stark konvergierenden Seiten". Bechyné (1952a) erroneously considered *differens* as a subspecies of *porphyrea* sensu Franz, 1952, and noted for *differens*: "die schrägen Seiten der pentagonalen Penisspitze", with reference to Franz (1952), from whose figure it can be seen that *trapezicollis* is conspecific with *differens*.

Lopatin (1988) supported the interpretation of *Ch. porphyrea* sensu Franz, 1952 and *Ch. trapezicollis.*

Medvedev, Okhrimenko (1991) followed Bechyné (1952a) and Lopatin (1988). They distinguished these two species mostly based on aedeagus structure: in *Ch. trapezicollis* aedeagus is gradually broadened to the apex, which has a clear median protuberance; and in *Ch. porphyrea* sensu Franz, 1952: aedeagus with parallel sides and pentagonal apex. Medvedev, Okhrimenko (1991) indicated the distribution of species as following: for *Ch. trapezicollis*: mountain areas of Krasnodar Krai and Georgia, and for *Ch. porphyrea* sensu Franz, 1952: mountain and foothill areas of Krasnodar Krai, Georgia, and Armenia. However, the localities of examined specimens of *porphyrea* sensu Franz, 1952 were given by Medvedev, Okhrimenko (1991) only from Krasnodar Krai and Abkhazia. On what basis did these authors add "Armenia" to the range, that is the habitat of the real *Ch. porphyrea* Faldermann, but not *porphyrea* sensu Franz, 1952? It can be assumed that Medvedev, Okhrimenko (1991) pointed "Armenia" after Bechyné (1952a), who described a new subspecies *Ch. porphyrea erivanicola* from Yerevan. Kippenberg (2012c) examined a syntype of *erivanicola* and transferred this taxon in the synonymy of *differens*. I agree with this decision. Thus, the area of *porphyrea* sensu Franz, 1952 does not cover Armenia.

Lopatin (2000b) repeated his understanding (Lopatin, 1988) of *Ch. porphyrea* sensu Franz, 1952 and *Ch. trapezicollis*. He described the areas as follows: for *Ch. porphyrea* sensu Franz, 1952: S-W part of Krasnodar Krai, Abkhazia, W Georgia, and for *Ch. trapezicollis*: W Georgia only. Lopatin (2000b) doubted the correctness of the record *Ch. porphyrea* sensu Franz, 1952 from Armenia. This record was not confirmed by the material. Lopatin (2000b) thought that the geographic label of the type specimen of *erivanicola* was incorrect. In fact, the label was correct, but it was incorrect to assign the subspecies *erivanicola* to *Ch. porphyrea* sensu Franz, 1952, as indicated above, with reference to Kippenberg (2012c).

Kippenberg (2012c) established a synonymy: 1) *porphyrea* sensu Franz, 1952 = *kubanica* (aedeagus of the type examined, *Lopatinica* figure 9) = *minutior* (aedeagus of the type examined);

2) *differens* (aedeagus of the type examined, *Lopatinica* figure 6) = *trapezicollis* (aedeagus of the type examined, *Lopatinica* figure 7) = *exsul* (type specimens, females examined, male is unknown) = *kutaisa* (aedeagus of the type examined) = *diga* (aedeagus of the type examined) = *erivanicola* (aedeagus of the type examined). I support this synonymy, except for the synonymy of *exsul* with *differens*. I have at my disposal two males, topotypes of *exsul* ("Caucas. Occid., Abago, leg. Starck", *Lopatinica* figure 10). They belong to *Ch. porphyrea* sensu Franz, 1952.

In view of the new data on the lectotype of *Ch. porphyrea* (see above), I establish a synonym for *porphyrea* Faldermann = *differens* Franz = *trapezicollis* Bechyné.

Senior available names for *Ch. porphyrea* sensu Franz, 1952 are *minutior* Bechyné and *kubanica* Bechyné originally described in the same article on the same page. However, an aedeagus structure of *minutior* deviates to that in *porphyrea* Faldermann = *differens* = *trapezicollis*. Thus, for more distinct interpretation of *porphyrea* sensu Franz, 1952, nec Faldermann, I use *kubanica* as a valid name using the principle of the first reviser (ICZN, 1999, 24.2.1).

Further study of the male aedeagus from different places led me to the conclusion, that in addition to the "typical *porphyrea*" (15 males from 9 localities examined) and "typical *kubanica*" (41 males from 17 localities examined) there are numerous specimens with intermediate shape of aedeagus (32 males from 18 localities examined) (Figs. 21, 22; *Lopatinica* figure 8). The "typical *kubanica*" males together with intermediate "*kubanica* – *porphyrea*" males have been collected in five localities, namely 1) Sochi: Razdolnoe vill., 2) Krasnaya Polyana, 3) Pseashkho Mt., 4) Maikop district: Khamyshki vill., 5) Abkhazia: Gagry district: Mamzyshka Mt. Thus I consider *porphyrea* and *kubanica* (mostly allopatric) as geographical subspecies. Kippenberg (2012c) was the first to express such assumption.

The subspecies *porphyrea* occurs in Transcaucasia: mostly on the southern slope of the Greater Caucasus and northern slope of the Lesser Caucasus as well as N-E Turkey; subspecies *kubanica* occurs mostly in the highlands of the western part of the Greater Caucasus (south of the Krasnodar Krai, Abkhazia); intermediate form *kubanica* – *porphyrea* occurs on the lowland and in the foothills: on the northwestern slope of the Greater Caucasus and along the Black Sea coast of the Krasnodar Krai and Abkhazia.

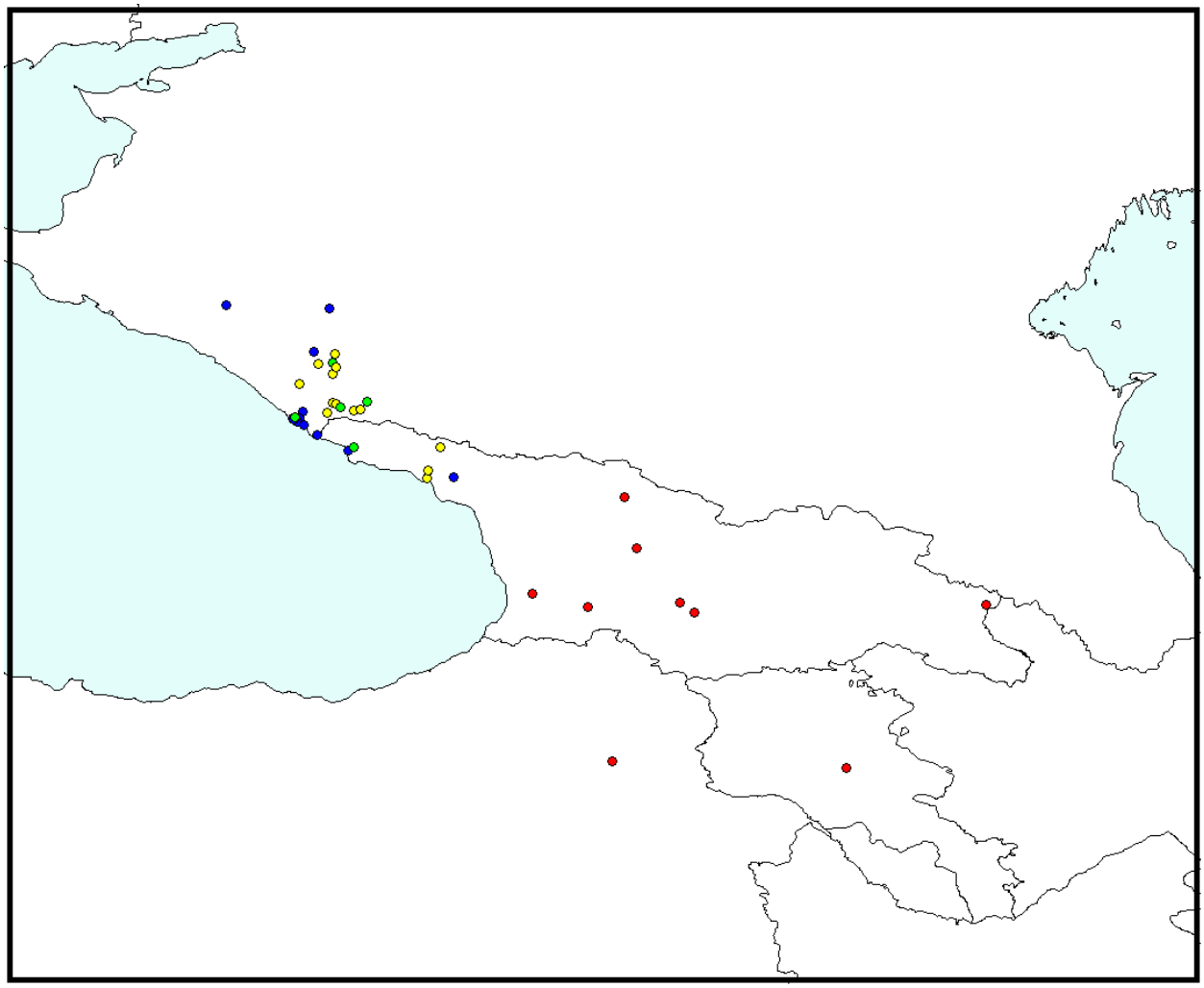


Figure 21. Area of *Chrysolina porphyrea*: red – *Ch. porphyrea porphyrea*, yellow – *Ch. porphyrea kubanica*, violet – intermediate form between subspecies *porphyrea* and *kubanica*, green – localities where the specimens of the subspecies *kubanica* and intermediate *porphyrea-kubanica* occur together.

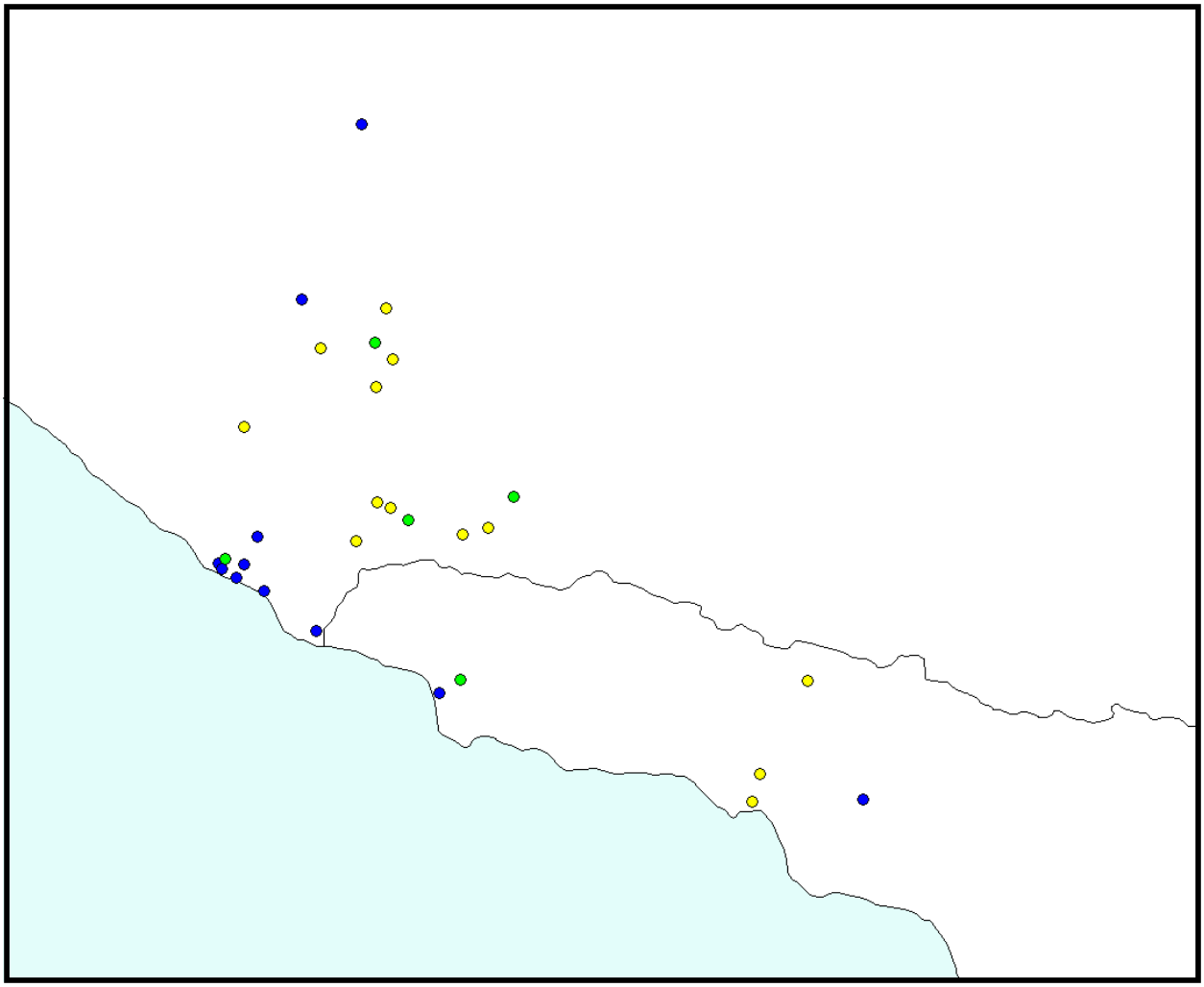


Figure 22. Area of *Chrysolina porphyrea* in the W Caucasus. Notation as in the previous figure.

195. Kippenberg (2012c) did not have at his disposal the type specimens of *Ch. kataevi*, when he described a new species *Ch. daccordiana*. He studied only the original description (Lopatin, 2000b) of the former. However, the picture of the aedeagus of *Ch. kataevi* made by Lopatin (2000b) in the original description is inaccurate.

I examined a holotype (male) of *Ch. kataevi* (*Lopatinica* figure 19), paratype (male) of *Ch daccordiana* (*Lopatinica* figure 20), original descriptions of both *Ch. kataevi* and *Ch. daccordiana*, and a figure of aedeagus (*Lopatinica* figure 18) of holotype *Ch. daccordiana* and came to conclusion that *kataevi* and *daccordiana* belong to the same species. Figures of aedeagi of "*Ch. kataevi*" published by Kippenberg (2012c) belong, at my opinion, to unknown species or some variability of *Ch. porphyrea* – fig. 13a, *Ch. adzharica* – fig. 13b (in the latter the aedeagus is widened in the form of flat triangular lobes at the sides of apical orifice, while in *Ch. kataevi* (including *Ch. daccordiana*) the sides of apical orifice are narrow, hardly triangularly widened).

196. The type locality of *Chrysomela affinis* is mentioned in the original description (Fabricius, 1787) as the following: "habitat <...> Barbariae". This location is treated (Bechyné, 1950a; Warchałowski, 2003) as Algeria. In fact, "Barbaria" is an area of N-W Africa, including Morocco, Algeria, Tunisia, and Tripolis.

Comments

Bourdonné (1984) designated a lectotype of *affinis*. I examined a description of lectotype together with the figure by Bourdonné (1984) (*Maenadochrysa* figure 1). The characters of the lectotype, including the double elytral puncturation: small punctures as large as those at pronotum, and large punctures are 2.5 X larger than those, elytral intervals even, legs wholly metallic violet, including the femora, corresponds to the available specimens from Tunisia, while the specimens from Algeria have large elytral punctures much larger, elytral intervals uneven, wrinkled, and femora red. Thus, the type locality of *Chrysomela affinis* should be considered Tunisia.

197. Bechyné (1950a) erroneously believed that the nominotypical subspecies of *Ch. affinis* occurs in Algeria (see Comm. 196). He described from Tunisia a subspecies *Ch. affinis xanthophryna* with the following characters: elytral intervals flat, not wrinkled, femora monochrome-violet, not red. I studied holotype and two paratypes of *Ch. affinis xanthophryna*, two more specimens from Tunisia identified by Bechyné as *Ch. affinis xanthophryna* (one of them, with label "Sousse, 3.6.1903" was mentioned by the author in the original description of this subspecies), together with additional specimens from Tunisia. I came to conclusion that the subspecies from Tunisia is *Ch. affinis xanthophryna* = *Ch. affinis affinis* (see also Comm. 196), while another subspecies, *Ch. affinis baetica* occurs in Algeria.

198. *Chrysomela atlantica* was originally described (Escalera, 1914) from the western coast of Morocco ("Mogador" = Essaouira). The type was not studied by any of the following authors and also unknown to me. The name *atlantica* is treated (Warchałowski, 2003) as questionable subspecies of *Ch. affinis*. The author, Escalera (1914), compared *atlantica* with the specimens of "*affinis*" from the N-E coast of Morocco. Kocher (1958) noted a discrepancy between the understanding of "*affinis*" by Escalera (1914) as to the original description of *affinis*, and to the specimens of *affinis*. In my opinion, such characters of "*affinis*" by Escalera (1914), as: pronotal lateral sides convergent from the base to the anterior margin and almost straight, sharp posterior corners of pronotum, presence of lateral ridge on pronotum, elytral punctures arranged in rows, bronze abdominal sternites, tibiae and tarsi reddish, do not correspond to any of the *Ch.* (*Maenadochrysa*) species, but correspond to *Ch.* (*Sulcicollis*) *peregrina*, also inhabiting Morocco.

199. *Ch. affinis bruttiana* was described from the extreme south of the Apennine peninsula. It differs, according to the original description (Bourdonné, 1999), from the subspecies *Ch. affinis hyacinthina* inhabiting Sicily only in the antennae less broadened to the apices. In the original description (Bourdonné, 1999) there is also a difference in the color of the femora: mostly red in *Ch. affinis bruttiana*, blackish blue or black in *Ch. affinis hyacinthina*. I examined two males (holotype and paratype) of *Ch. affinis bruttiana* (*Maenadochrysa* figures 26, 27). Both have femora rufous with extremely base and apical 1/4 violet. Sicilian specimens of *Ch. affinis hyacinthina* being at my disposal have femora metallic-violet, or red with violet apex and basal darkening and with transitions between metallic and red colors: red shines through the metallic luster. The difference between the subspecies *bruttiana* and *hyacinthina* in the degree of extension of the antennae according to the drawings by Bourdonné (1999) can hardly be traced, while some available specimens from Sicily have antennae exactly similar as shown in the figure by Bourdonné (1999) for the subspecies *bruttiana*. Thus, I believe the names *bruttiana* and *hyacinthina* to belong to the same subspecies.

200. Bourdonné (1999, 2010a) established three subspecies of the same species, *Ch. affinis: hyacinthina, cribellata, thalassina,* to occur in Sicily. In my opinion, the differences of these forms

lie within the limits of individual variability. According to the material being at my disposal, there is one subspecies, *Ch. affinis hyacinthina* in Sicily.

201. The subspecies *nevadensis* Cobos, 1952 belongs to the species *Ch. affinis* (according to the aedeagus structure), but not to *Ch. femoralis* (as the author, Cobos believed). This subspecies inhabits province Granada, high in the mountains, 2000 m above sea level (after Cobos, 1952) and higher (available specimens from Santa Barbara Mt., 2269 m). It is characterized by a black coloration of the upper side, in contrast to *Ch. affinis baetica* inhabiting also in southern Spain, but on the plain near the sea.

202. *Chrysomela tagenii* Herrich-Schaeffer, 1839 was originally described from Portugal ("Lusitan."). The type has not been studied by any of the subsequent authors. The author, G. Herrich-Schaeffer, ascribed this name to Hoffmansegg. J.-C. Hoffmansegg (1766–1849) was German entomologist and botanist, several times travelled in Portugal. Probably the material was obtained by Herrich-Schaeffer from Hoffmansegg supplied the name "*tagenii*" on the label. However, the author of the name *tagenii* is in fact Herrich-Schaeffer (1839), since he has not specifically noted the opposite anywhere.

Suffrian (1851) believed that "*Tagenii* Hffgg." in the work by Herrich-Schaeffer (1839) is an incorrect original spelling of the name *tagana*. He believed so because he received from MNHUB the specimens collected by Hoffmansegg in Portugal and supplied with the label "*Tagana* Hoffmsegg." The author, E. Suffrian, ascribed the name *tagana* to Hoffmansegg. However, the author of the name *tagana* is in fact Suffrian (1851).

Comparison of a very short original description and a figure of *tagenii* by Herrich-Schaeffer (1839) with a detailed description of *tagana* by Suffrian (1851) allows me to conclude that these are different taxa. Taxon *tagenii* is characterized by the following features: legs with femora reddish brown, dorsal side of body bronze brown, pronotal lateral calli are separated from the disc only on the base by short furrow (according to the figure). Taxon *tagana* is characterized by the following features: legs entirely of blue-steel color with slight coppery tint, dorsal side of body blackish green, pronotal lateral calli separated from disc by shallow impression along entire length. Body length of *tagana*, after the original description (Suffrian, 1851), is 10.2–12.7 mm – it is more than that in the members of the subgenus *Ch.* (*Maenadochrysa*), while *tagenii*, based on the original description (Herrich-Schaeffer, 1839), is a taxon closely related to *Ch.* (*Maenadochrysa*) *affinis.*

Referring to *Ch. tagenii* Herrich-Schaeffer, Suffrian nevertheless described another new taxon from another area (S France, Switzerland, S Spain). He wrote that this species was identified as "*femoralis*" or as "*tagenii*" in different collection. Suffiran distinguished this new species from the former, *Ch. femoralis*, and believed that the latter, *tagenii*, was never named (but there was only incorrect spelling of the name *tagana*), and described a new species under the name *confusa*.

Thus, *Tagenii*: Suffrian – is incorrect subsequent identification, it is unavailable, but *confusa* Suffrian – is an available name and not a synonym of the real *tagenii* Herrich-Schaeffer.

Subsequently, because of the erroneous treatment of the synonymy *tagenii* (= *confusa*), the taxon was regarded as *Ch. femoralis* ab. *tagenii* (from "Mittelalpen") (Weise, 1916) or *Ch. femoralis* subsp. *tagenii* (from France: Basses Alpes). Only recently the treatment has more or less returned to the original. Kippenberg (2010) considered *Ch. baetica tagenii* Herrich-Schaeffer (from Portugal and Spain) and *Ch. femoralis confusa* Suffrian (from France).

203. There is no clear understanding of the species *Ch. vermiculosa* in the literature of the 20th and early 21st century. It was originally described from the Mediterranean coast of Algeria. The species absents in the keys by Peyerimhoff (1938), Bechyné (1950a), and Warchałowski (2003). Nothing is said about the hind wings in the original description (Marseul, 1886). Peyerimhoff (1938) wrote that he examined a type, found developed hind wings and therefore excluded *Ch. vermiculosa* from the subgenus *Ch.* (*Threnosoma*). Kippenberg (2010) attributed *vermiculosa* to *Ch.* (*Maenadochrysa*) *affinis*.

I examined: 1) the original description of *Ch. vermiculosa*, 2) male compared by E. Reitter with the type of *Ch. vermiculosa*, 3) specimens identified as *Ch. vermiculosa* in ZIN, HNHM, NHMW, and 4) additional specimens from Algeria. All these specimens belong to the subgenus *Ch.* (*Threnosoma*). They correspond to the original description of *Ch. vermiculosa* and differ from the subgenus *Ch.* (*Maenadochrysa*), and in particular from *Ch. affinis* by larger body, red tibiae, 1st tarsomere with entire sole in female, male aedeagus is stronger, almost half curved.

In the original description of *Ch. vermiculosa*, the color of the upper side was described as "noir-vert". Available specimens are black with a weak metallic brass greenish tint. A specimen, compared by E. Reitter with the type of *Ch. vermiculosa*, has very short hind wings. Apparently, Peyerimhoff (1938) was mistaken when he described the wings.

204. Substitute name *Medvedevlevna* Özdikmen, 2008 was suggested in violation of ICZN (1999 Attachment A, 3). Özdikmen (2008) explained his decision to publish a substitute name for *Chrysolina* (*Jacobsonia* L.Medvedev, 1970) as follows: "As far as I know, Lev N. Medvedev (Russia) is still alive. I found two different e-mails of Dr. Medvedev but I could not reach him even though all my efforts". At the same time, in the year preceding the publication of the article by Özdikmen (2008), L.N. Medvedev actively worked (as in previous and subsequent years) and published, in 2007–2008 at least 10 articles in various journals printed in Russia, Switzerland, Poland, and Germany, alone and in co-authorship with Russian and foreign entomologists, worked on the compilation of the new Catalogue of Palaearctic Coleoptera (L.Medvedev, 2010). Therefore, the inability to contact with L.N. Medvedev was, evidently, the result of insufficient efforts.

205. Subspecies *Ch. grossa* s.str. and *Ch. grossa tingitana* differ, according to the literature, as follows (Fig. 23).

Figure 23. Characters of the subspecies of *Ch. grossa* in literature sources.

Ch. grossa s.str.		*Ch. grossa tingitana*		References
characters	area	characters	area	
-	-	pronotum coppery green, elytra darker, than in *grossa* s.str., with metallic sheen near suture	N Morocco	Escalera, 1914
pronotum very shining, without distinct microscopical reticulation, with punctures finer; elytra without metallic sheen; pronotum blue, bluish violet, green.	Dalmatia, Bosnia, Istria, S Tirol, Italy, Sicily, Malta, S France, Spain, Tunisia, E Algeria	pronotum with distinct microscopical reticulation, with punctures stronger; elytra usually with metallic sheen near suture and scutellum. Pronotum green.	Morocco, S Spain.	Bechyné, 1950a
pronotum not reticulate, strongly shining	Mediterranean reg. except Morocco and S Spain	pronotum reticulate, feebly shining	Morocco, S Spain	Warchałowski, 2003

I examined a number specimens of *Ch. grossa* from Morocco. Some of them (including 3 specimens from Tanger – a type locality of *tingitana*) correspond to the original understanding of the subspecies *tingitana*: pronotum salad green, with a noticeable microreticulation, elytra with a weak but distinct bluish shine. Other specimens from Morocco have pronotum without microreticulation, and elytra with very weak metallic shine (2 specimens) or elytra without metallic shine. On the other hand, I have some specimens from S Spain in which pronotum is bluish green with very weak microreticulation and elytra with weak metallic shine (intermediate form between *grossa* s.str. and *grossa tingitana*). Size of pronotal punctures does not differ in the specimens from Morocco and other parts of the specific range. Noticeable microreticulation of pronotum occurs only in a part of specimens from Morocco. Thus, in my opinion, there are no grounds for a clear separation of these subspecies.

206. I examined 2 paratypes (males) and 1 topotype (female) of *Ch. lucida torresi*, all collected in Valencia (*Melasomoptera* figures 9, 10), and 3 topotypes (male and 2 females)* of *Ch. lucida suarezi* (*Melasomoptera* figure 12), collected by J. Suarez (which collected the types of *suarezi*), in the type locality, Almeria: Laujar, only three years later, in 1952, and identified by the author of the subspecies, Cobos as "*Ch. lucida suarezi*". I compared these materials and came to the conclusion about the complete identity of *lucida torresi* and *lucida suarezi*, including the structure of the aedeagus and puncturation of the pronotum.

Footnote: * – the subspecies *Ch. lucida suarezi* was described based on 3 specimens (2 males and 1 female), collected in 1949 (Cobos, 1952).

207. *Chrysomela orientalis* was originally described from Istanbul (Constantinople). According to the characters given in the original description, this species can not be separated from relatives *Ch.*

vernalis, Ch. turca, Ch. cretica, Ch. sahlbergii. The size of the body is not mentioned in the original description. However, the author (Olivier, 1807) noted: "Magnitudo et statura *Ch. Bankii*", [*Ch. banksi* is 8.1–10.2 mm long], that is, *Ch. orientalis* is a rather large *Chrysolina*. A detailed redescription of *Ch. orientalis* was prepared by Suffrian (1851), which put it together *Ch. vernalis* and noted that *Ch. orientalis* occurs also in Greece. Weise (1884a) included *Ch. orientalis* in the group with *Ch. vernalis* and *Ch. cretica*, which, among other features, are characterized by reduced hind wings, very wide tarsomeres 1–3 in male and "eigenthümlichen Bau des Penis". Weise (1884a) compiled a key and also noted that *Ch. sahlbergii* "ist der *Chr. orientalis* in Form, Farbe und Skulptur sehr ähnlich, aber vollkommen geflügelt". Bechyné (1950a) published a key to the subgenus *Ch.* (*Ovosoma*) and approved the understanding of *orientalis*, that existed at that time. According to Bechyné (1950a), *Ch. orientalis* has the following features that distinguish it from related species: elytral punctures sparse, hollow-shaped, arranged in 9 regular, paired rows; hind wings reaching mid-length of elytron; male last abdominal sternite with shallow impression; base of apical projection of aedeagus is broad; pronotal lateral callus separated from disc by deep impression only in basal ⅓.

Dahlgren (1984), contrary to the existing understanding of *Ch. orientalis*, depicted an aedeagus with a narrow base of the apical projection (just like *Ch. sahlbergii*), and included in the distribution area Rhodes, Cyprus, Syria, Israel, the Caucasus, Iran, Tunisia and supposedly Iraq. So he confused this species with *Ch. sahlbergii*. However, Dahlgren (1984) did not study the type of *Ch. orientalis* and did not explain this point of view in any way. Although this point of view was not supported (Warchałowski, 2003), but the new Palaearctic catalogue (Kippenberg, 2010) considered *sahlbergii* (together with *halysa* and *rhodia*) as subspecies of *Ch. orientalis*. This contradicts the understanding of *Ch. orientalis* by Suffrian (1851), Weise (1884a), and Bechyné (1950a).

The curator of the MNHN collection, A. Mantilleri, informed me that the type of *Chrysomela orientalis* cannot be found there. This type is very probably lost or destroyed. Therefore, I designate a neotype of *Chrysomela orientalis* to save the predominant usage of the name (ICZN 1999, 75.1, 75.3).

Neotype is a male collected in Bursa city (N-W Turkey) located in 84 km to the south of the type locality (Istanbul), in similar landscape and climatic conditions. This specimen does not contradict the original description, except for coloration. According to Olivier (1807), "La tête, le corcelet <…> sont d'un noir violet", "Les élytres sont d'un noir violet". Neotype is dark golden green from above. However, the coloration of this species is variable. Neotype completely corresponds to the understanding of *Ch. orientalis* by Suffrian (1851), Weise (1884a), Bechyné (1950a), but in this specimen only 1st and 2nd basal antennomeres rufous from below, while Suffrian (1851) noted 1st-3rd ones.

Diagnosis of *Chrysomela orientalis* Olivier, 1807 (based on the neotype) (*Ovosoma* figures 31–33).

Body broadly-oval, moderately convex in lateral view, metallic, above dark golden green, dull, with elytral large punctures bluish black margined with purple, antennomeres 1, 2 rufous below, underside and legs bluish black. Last maxillary palpomere elongate-oval, obliquely truncate apically, longer than penultimate and as wide as the latter. Pronotum broadest basally, with lateral sides slightly rounded, strongly convergent anteriorly, with convex lateral calli along entire length, with deep, narrow lateral furrows in basal ⅓ and broad shallow impressions in anterior ⅔, pronotal surface, including lateral impression and callus covered with sparse fine punctures. Prothoracic hypomeron convex, with shallow broad lateral impression covered by obsolete transverse wrinkles;

basal fold strong. Anterior projection of metasternum marginated. Elytra with very large deep foveiform punctures, mostly arranged in paired rows (with only few large punctures in intervals), intervals between rows covered by sparse, very fine punctures and fine sparse wrinkles. Elytral epipleura visible along entire length in lateral view, bearing short setae apically. Hind wings strongly reduced, narrow, about 2 X shorter than elytron. Pygidium with strong longitudinal medial furrow along entire length. Last abdominal sternite weakly convex, with broad shallow impression apically and bearing narrow furrow along apical margin. Tarsomeres 1–3 with entire sole, claw tarsomere without denticles. Tarsomeres 1–3 very broad in fore- and mid-tarsi, moderately broad in hind-tarsi. Aedeagus with apical projection broad, slightly narrowed basally and 2.5 X narrower there than maximal width of aedeagus. Body 10.0 mm long, 6.5 mm wide. Elytron 8.0 mm long, hind wing 4.7 mm long, 1.1 mm wide.

Neotype *Ch. orientalis*: Asia Minor, Brusa (=Bursa), Jureček leg.: 1 male (MNHN).

Variability. 13 more males (5 with aedeagus mounted) and 18 females from Bursa (NMP) are conspecific with the neotype. Coloration is variable in them: 1) dorsum dark coppery, elytral punctures black narrowly margined with violet, 2) dorsum dark bluish green, elytral punctures violet, 3) dorsum unicolorous dark coppery olivaceous or blue, or green; pronotal lateral sides straight, or slightly rounded, or strongly rounded; dorsum moderately shining, or elytra shining and pronotum dull, or dorsum dull. Males 8.3–9.6 mm, females 8.7–9.6 mm long.

208. According to original description (Bechyné, 1949b), *Ch. cuprina staneki* differs from the nominotypical subspecies by the lateral elytral rows being at equal distance from each other, and the dorsum black. I examined syntype, male (*Hypericia* figures 6, 42). It has lateral elytral puncture rows paired, 6th with 7th, 8th with 9th; distance between rows 6 and 7 (or 8 and 9) approximately as wide as puncture diameter, and distance between rows 7 and 8 approximately as wide as 1.5–2.0 puncture diameter. Dorsal side shining, black (this color occurs in the nominotypical subspecies). 5th elytral row consists of 20 and 21 punctures in the left and right elytron, respectively, 9th row consists of 24 punctures. Body length 6.15 mm. Therefore, I believe *staneki* to be a synonym of *cuprina*.

209. Morphological heterogeneity within *Ch. vernalis* has led to descriptions of a number of intraspecific forms. Currently, these forms are considered in the subspecific rank. According to the literature, these subspecies differ from each other in: size of elytral punctures, shining and relief of elytra, color of dorsum, size and shape of body, shape of pronotal lateral sides, depth of pronotal lateral impression as follows (Fig. 24, subspecies from the eastern part of the specific area).

Figure 24. Characters of the subspecies of *Ch. vernalis* (beginning) in literature sources.

Ch. vernalis vernalis		*Ch. vernalis herii*		*Ch. vernalis italica*		*Ch. vernalis muchei*		*Ch. vernalis ottomana*		References
characters	distribution	characters	distribution	characters	distribution	characters	distribution	characters	distribution	
elytr. punct. fine, sparse; intervals broad, sericeous, scarcely micro-punct.; dorsum greenish bronze, blue, bluish violet; length 8–11 mm	S Balkan, Dalmatia	elytra rugosely punctate; bluish black, green, black; length 7–9.5 mm	Dalmatia, Albania, Bulgaria	elytral punctures stronger than in *vernalis* s.str., intervals less shining than in subsp. *ottomana*; body more elongate than in subsp. *ottomana;* 8–11 mm	Italy, Tyrol, S France			elytr. punct. stronger than in *vernalis* s.str., intervals broad, more shining than in *vernalis* s.str., obsoletely micro-punct.; body more rounded; length 8–11 mm	Turkey, S Bulgaria, N Greece	Bechyné, 1950a
pronotal lateral sides straight	including Croatia	pronotal lateral sides almost straight	including Albania			pronotal lateral sides rounded	E Bulgaria (Black Sea shore)			Mohr, 1969
(as *bicolor* Germ.) pronot.lateral sides straight; pronot.lateral callus separated by deep impression in basal ½ only	?	pronot. lateral sides rounded; pronot.lateral callus wholly separated by deep impression; black with green or blue sheen	Corfu (after Dejean, 1833)							Herrich-Schaeffer, 1839

Comments

Figure 24. Characters of the subspecies of *Ch. vernalis* (ending) in literature sources.

Ch. vernalis vernalis		*Ch. vernalis herii*		*Ch. vernalis italica*		*Ch. vernalis muchei*		*Ch. vernalis ottomana*		References
characters	distribution	characters	distribution	characters	distribution	characters	distribution	characters	distribution	
dorsum golden green, shagreen; pronotal lateral sides straight; pronotal lateral impression deep posteriorly, shallow anteriorly; elytra deeply punctate	Mediterra-nean basin	small; dorsum blackish green or blackish blue; elytra mostly densely and deeply punctate, intervals distinctly punctulate	?	dorsum almost dull; pronotal lateral callus anteriorly absent	?			shining, dorsum mostly black; pronotal lateral impression entire, anteriorly largely punctate	Turkey ("Constantinopel"), Bulgaria ("Kodscha Balkan")	Weise, 1882
metallic reflex of upper side greenish bronze, blue violet, or absent				elytral punctures strong, interstices feebly shining, metallic reflex dark greenish blue	Italy, Tyrol, S France			elytral punctures strong, interstices shining	Turkey, Bulgaria, Greece	Warchałowski, 2003

Figure 25. Variability of the characters in *Chrysolina vernalis* from the eastern part of the specific area.

region (*taxon* described from this region, if available)	size of elytral punctures (% specimens)					coloration of elytra (% specimens)					shining of elytra (% specimens)			shape of pronotal lateral side (% specimens)				body length (mm)		length / width	speci-mens exami-ned
	1	2	3	4	5	1	2	3	4	5	1	2	3	1	2	3	4	m	f		
Greece, except Corfu (*vernalis*)	8	38	39	15	0	36	18	15	17	14	23	36	41	18	66	10	6	8.1–10.9	7.9–10.6	1.4–1.7	88
Corfu Isl. (*herii*)	4	17	57	22	0	19	43	36	0	2	47	38	15	11	74	13	2	8.6–10.7	9.2–11.1	1.4–1.6	47
Bosnia-Herzegovina, Croatia, Serbia, Slovenia	6	20	56	16	2	50	10	13	27	0	28	49	23	6	76	15	3	8.2–10.3	8.1–10.3	1.5–1.7	80
Montenegro, Macedonia, Albania	7	17	55	21	0	97	3	0	0	0	66	31	3	14	62	21	3	8.6–10.6	8.1–10.1	1.4–1.8	29
Italy (*italica*)	13	47	38	2	0	74	22	2	2	0	36	39	25	7	59	27	7	8.3–10.6	8.0–10.7	1.3–1.7	92
Turkey (*ottomana*)	12	12	60	8	8	64	16	8	12	0	32	52	16	8	52	36	4	7.9–10.3	8.3–10.5	1.3–1.7	25

Legend: Size of elytral punctures: 1–5 – relative size from the smallest to the largest, in the middle part of the disc; coloration of elytra: 1 – blue, 2 – bluish green, 3 – golden green, 4 – bronze green, 5 – coppery; shining of elytra: 1 – shining, 2 – sericeous-shining, 3 – dull; shape of pronotal lateral side: 1 – emarginate in basal ½, 2 – straight along entire length or slightly rounded anteriorly, 3 – straight in basal ½ and distinctly rounded in anterior ½, 4 – rounded along entire length.

Comments

Dahlgren (1984) was the last who examined the geographic variability of *Ch. vernalis*. He did not subdivide this species into subspecies, but noted variability in the size of elytral punctures and their density associated with the size of them. Dahlgren (1984) established three states of this feature: 1) punctures fine and sparse, 2) punctures of medium size and density, 3) punctures large and dense. Dahlgren (1984) found: states 1 and 2 in different localities in Croatia except the south; mostly 3 (1 absent) in the south of Croatia and further to the south (in Montenegro, Macedonia, Albania); states 1, 2, 3 in Greece; mostly state 3 in Turkey; states 2 and 3 in Italy.

I have examined numerous specimens from different regions (Fig. 25). Besides that, I have at my disposal few specimens from Austria, Switzerland, Crete Isl., Hungary, Bulgaria, Azerbaijan, Lebanon, Egypt, Algeria, and Morocco. Single specimens were not taken into account in the analysis of geographical variability. The records of *Ch. vernalis* in N Africa, Lebanon, and Transcaucasia have not been confirmed by the recent materials. Probably, these labels are incorrect.

Results. 1) The size of the elytral punctures does not show geographic variability, most specimens from all regions have punctures of medium size. 2) The coloration of elytra: bluish green and golden green beetles dominate on Corfu Isl. (79%), blue beetles dominate in other regions. The difference is sufficient to separate the subspecies *herii* on Corfu Isl. Beetles from Greece are most similar in coloration with those from Corfu. There are probably intermediate forms in Greece. Among the specimens from the type locality of *Ch. vernalis* (Peloponnese Isl.) the dorsal colorations are follows: "1" – 27%, "2" – 27%, "3" – 0%, "4" – 23%, "5" – 23% (color designation, see legend to fig. 25). It differs from that in Corfu by a larger proportion of blue specimens; 3) Shining beetles sharply dominate in Montenegro, Macedonia, and Albania, but the difference is insufficient to separate the subspecies; 4) there are no differences in the shape of the pronotal lateral sides: beetles with straight sides dominate in all regions; 5) there are no differences in body size and shape.

210. Subspecies *Ch. vernalis muchei* is described from the Black Sea coast of Bulgaria (Mohr, 1969). A number of the type specimens was not indicated. The only difference from other subspecies, mentioned in the original description, is the arcuate lateral sides of pronotum. There are three specimens of *Ch. vernalis* from Bulgaria, including one from the Black Sea coast (environs of Bourgas city, 26 km SW from the type locality of subsp. *muchei*) at my disposal. All of them have pronotal lateral sides straight or rounded only at the apex and nothing differ from *Ch. vernalis* s.str. On the other hand, there are a few specimens with rounded pronotal sides from different places of the species range (see fig. 25). Thus, it can be concluded that rounded pronotal sides are individual variability, and *muchei* is a new junior synonym of *Ch. vernalis* s.str.

Taxon *herii* was originally described as a separate species (Herrich-Schaeffer, 1839). It was later considered as a subspecies: *Ch. vernalis herii*. The original description of *Chrysomela Herii* does not contain the information on the type locality (Herrich-Schaeffer, 1839), but it contains indication (ICZN, 1999, 12.2.1) that this species was mentioned earlier in the Dejan's catalog as a variation of *Ch. bicolor*. In fact, Chevrolat in Dejean (1833, p. 400) writes: "*Chrysomela bicolor* Var. *Herii*. Sturm. *Corfou*." The name *Herii* by Chevrolat in Dejean (1833) is a *nomen nudum*, but the indication of a type locality should be taken from this work . No materials from G. Herrich-Schaeffer collection were studied by recent authors. The type of *herii* should be considered as lost. I designate a neotype of *herii* to establish the taxonomic position of this taxon. It is a male with the label "Balkan, Corfu, Paganetti, 1903" (MTD). It corresponds to the characters of the species *Ch. vernalis*, with antennomeres 1 and 2 rufous below, elytra golden green, shining, covered by rather large punctures (size of punctures is 4 or 5, see Fig. 25), pronotal lateral sides straight, pronotal

lateral impression furrow-shaped, distinct in basal ½, and shallow, but distinct in apical ½, body length 10.4 mm, width 6.5 mm, aedeagus as in *Ovosoma* fig. 12 in the chapter "Review of subgenera". I consider *herii* to be a separate subspecies (see above).

The taxon *italica* was originally described as a variation of *Ch. vernalis* very briefly (Weise, 1882). All original characters are included in fig. 24. The type locality was not originally indicated. Weise (1916) considered *italica* to be an aberration, but supplied with the region of habitat: "Italien". Bechyné (1950a) noted Italy, Tyrol and S France for the subspecies *Ch. vernalis italica*. I examined the syntypes of *italica* and large series of *Ch. vernalis* from Italy. I did not find any differences of *italica* from the nominotypical subspecies.

The original characters of the subspecies *Ch. vernalis ottomana* Bechyné, 1950a are included in fig. 24. I examined the specimens from Turkey including those from the type locality ("Constantinopel"). I did not find any differences of *ottomana* from the nominotypical subspecies.

211. The available material from Pyrenees and N Spain allows us to assume three geographical subspecies of *Ch. vernalis* there (Fig. 26). These subspecies have aedeagus similar to that in *Ch. vernalis* from the eastern part of the specific range. Distinguishing characters of these western subspecies are included in the fig. 26 below.

Taxon *cantabrica* was described from N Spain (I examined syntypes, *Ovosoma* figures 21–30). All available specimens of this subspecies well differ from the others by pronotal lateral furrow distinct in basal ½.

Three nominal taxa were described from Central Pyrenees. A senior synonym is *Timarcha pyrenaica* Dufour, 1843. The original description in "Excursion entomologique dans les montagnes de la vallée d'Ossau" is very brief: "Ant.[antenne] uniformém. moniliformes. Aptères". "Ov.[ovale], noire; pat.[pattes] bleues; cors.[corselet] à côtés dr.[droit], à ponct. tr.[très] fine; él.[élytres] à ponct. irrég., affectant parfois une disposit. sériale; 1.er art. d. ant.[antenne] fauve à l'extr. [extérieur]. Long. 8–10 m.[mm]. H.[habitat] sous l. pier. [les pierres]; pacag.[pacage] alp.[alpestre]. "

Already in the 19th century and at the beginning of the 20th century, this taxon was considered in the specific rank within the genus *Chrysolina* (= *Chrysomela*) (Weise, 1882, 1916; Marseul, 1887). Subsequently it was considered as a subspecies *Ch. vernalis pyrenaica* by Bechyné (1952b) and Warchałowski (2003) or separate species (Dahlgren, 1984). It was not noticed that someone has studied the type.

The collection by L. Dufour (1780–1865) was deposited in MNHN except the earlier materials (of 1808). I examined three syntypes (2 males, 1 female) of *pyrenaica* . They correspond to both, the characters of the species *Ch. vernalis* and the original description of *pyrenaica*. They have antennomeres 1 and 2 rufous below, dorsum of body black, moderately shining, elytra covered by dense, moderately large punctures, almost entirely confuse, with intervals almost flat or scarcely wrinkled, covered by dense, very fine punctures, pronotal lateral sides almost straight, weakly rounded, strongly converge towards the front, pronotal lateral furrow very weak, developed only in basal ½, lateral impression completely absent in apical ½.

There are two mountains in the Central Pyrenees not far from each other: Pic du Midi d'Ossau and Pic du Midi de Bigorre. *Ch. pyrenaica* was originally described, according to the original description, from the environs of the former mountain, and *Ch. carbonaria* was described from the latter. Comparison of the syntypes of *pyrenaica* and *carbonaria* (*Ovosoma* figures 13–20) shows that these names are conspecific.

Variation *gallica* was originally described very briefly: "Callo laterali prothoracic nullo", without the indication on the type locality. I examined two males labeled "Gallia merid." from old

collection (of 1839). They correspond to the original description of *gallica* (pronotal lateral impression is very weak in one specimen, and absent in the other, elytra without wrinkles, dorsum black with weak bluish reflection. I believe them to be conspecific with *pyrenaica*.

Subspecies *egelida* was described from Navarre (I examined topotypes). Among the available specimens, 77% are dark blue. This coloration is very rare among the specimens from other parts of the Pyrenees and completely absent in northern Spain. Thus, *egelida* shares the criterion of subspecies (difference in more than 75% of the specimens).

Subspecies *canfrancensis* was described from the southern spurs of the Central Pyrenees. After the original description, it is very close to *pyrenaica* and differs: "par la forme sensiblement allongée et moins convexe, par la ponctuation des élytres plus marquée et par les élytres trés régulièrement arrondis". I examined two males, syntypes (NMP, ZSM) . These specimens correspond to all the characters of *pyrenaica*. One syntype has pronotal lateral furrow weak in basal ½, other syntype has not any lateral impression, dorsum black – the most specimens from Central Pyrenees share these characters; elytral intervals covered by moderately large wrinkles in both syntypes – 23% specimens from Central Pyrenees share this character.

Figure 26. Variability of *Ch. vernalis* from the western part of the specific area.

region	pronotal lateral furrow in basal ½ (% of the specimens)			wrinkles in elytral intervals (% of the specimens)			coloration of dorsum (% of the specimens)		number of specimens examined
	distinct	weak	absent	strong	moderate	almost absent	black	dark blue	
Asturias and Cantabria	100	-	-	37	41	22	100	-	41
Navarre	-	77	23	-	-	100	23	77	13
all the Pyrenees	-	61	39	-	30	70	91	9	33
Central Pyrenees	-	69	31	-	23	77	85	15	13

212. The original description (Apfelbeck, 1912) of *Ch. minckwitzi* includes the following characters to distinguish this taxon from *atrovirens*: *minckwitzi* has the body more flattened and less rounded laterally, pronotum covered by finer punctures, pronotal lateral furrows deep near base, elytral punctures arranged in nearly regular rows, elytra wider in comparison with pronotum. Apfelbeck (1912) writes nothing about whether he examined the type of *atrovirens*.

Müller (1948) cited these features of *minckwitzi*. Kippenberg (2003a) redescribed the types of *atrovirens*. I had at my disposal 12 specimens of *minckwitzi* from Bosnia, including 6 syntypes (2 males and 4 females) (*Ovosoma* figures 56–64). I found that: 1) body shape varies in convexity and roundness on the sides in Bosnian specimens, 2) pronotal punctures varies from fine to rather large in Bosnian specimens [Kippenberg (2003a) described lectotype of *atrovirens* with fine pronotal punctures], 3) pronotal lateral furrows varies by the depth from distinct to weak in Bosnian specimens [Kippenberg (2003a) noted for *atrovirens* that pronotal furrows are weakly impressed, usually sharp, but sometimes obsolete (as in lectotype)], 4) paired puncture rows can be traced on elytra of Bosnian specimens, these rows undulate and some irregular, hardly visible among the

punctures of intervals in some specimens [Kippenberg (2003a) noted irregular paired rows in the types of *atrovirens*, and variability by the density and size of the punctures in the four specimens studied by him], 5) humeral angles of elytra are distinctly projecting out of pronotal base in the Bosnian specimens, 6) apical lobe of aedeagus is scarcely narrower than the body of aedeagus before the apical orifice in *atrovirens* (after the figure by Kippenberg, 2003a) and this lobe is distinctly narrower than the body of aedeagus in the available Bosnian males. I can conclude that the shape of the apical lobe of aedeagus is the only difference between the subspecies *Ch. atrovirens atrovirens* and *Ch. atrovirens minckwitzi* (cf. *Ovosoma* figures 56 and 65).

213. I have at my disposal one pair (male and female) from Albania, corresponding to the characters of the species *Ch. atrovirens*. Müller (1948) indicates the following features to distinguish the Albanian subspecies *Ch. atrovirens winneguthi* from Bosnian subspecies *Ch. atrovirens minckwitzi*: 1) light bronze dorsal color (available Albanian specimens are light bronze, while those from Bosnia are bluish green, golden green, blue or almost black with barely visible metallic luster, 2) smaller body, 5.5–7.0 mm long (available specimens from Bosnia and Albania do not differ in size), 3) pronotum less trapezoidal, distinctly arcuate on the lateral sides (available specimens from Albania have pronotum arcuate laterally, and those from Bosnia have pronotum straight laterally and rounded only in front or completely arcuate, the difference in the degree of narrowing forward is not observed, 4) pronotal lateral furrow broader and longer (in available Bosnian specimens the furrow varies in both width and length, does not differ from that in Albanian specimens). I did not find any differences between Albanian and Bosnian specimens in the shape of aedeagus. Thus, the difference between subspecies *minckwitzi* and *winneguthi* is only in coloration.

214. Chûjô, Kimoto (1960) suppressed *pseudogeminata* as a synonym of *aeruginosa*, without an examination of the types. The type series of *pseudogeminata* contains two females conspecific with *Ch. difficilis* and one male (*Hypericia* figure 40) conspecific with *Ch. nikkoensis*. The latter has dorsum blue, shining, aedeagus mounted, similar with that in *Ch. nikkoensis*. For the establishment of the understanding of the name *pseudogeminata* (=*difficilis*) I designate here a female with original label "TYPUS" (NMP) as a lectotype.

215. Kippenberg (2010) in the Palaearctic Catalogue considered *joliveti* to be a subspecies of *Ch. obscurella*. I studied a holotype of *Ch. joliveti* (*Threnosoma* figure 30). This is certainly not a subspecies of *Ch. obscurella*, because it has aedeagus with a well separate apical lobe, and not with lateral teeth, as in *Ch. obscurella*. I believe *Ch. joliveti* to be a separate species, close to *Ch. cribrosa*.

216. Type locality of *Ch. coerulea azurea* was indicated in the original description (Bechyné, 1946) as: "Persia: Elbrus", and the type specimens were labeled as: "Elbrus Geb. Persien". Two geographical names are mixed here: 1) Mountain Elbrus in the Lateral Range of the Greater Caucasus on the border of the republics of Kabardino-Balkaria and Karachaevo-Cherkessia near the northern border of Georgia, and 2) Mountain Elburs in the north of Iran near the southern coast of the Caspian Sea. The minimum distance between these mountains is 770 km (from Elbrus Peak to Talysh Mountains – the westernmost part of Elburs Mountains). Taking into account the explicit indication of "Persia", I refer the type locality of *azurea* to the Elburs Mountain in Iran.

I studied a type series of *Chrysolina coerulea azurea* containing five males (three with mounted aedeagi) and three females (NMP) (*Ovostoma* figure 8). I did not find the external

differences of the type series of *azurea* from the subspecies *Ch. olivieri olivieri*, and the aedeagus of the holotype of *azurea* is also similar to that of *olivieri* and does not look like it was drawn in the original description.

Most range of *Ch. olivieri* is in the mountains of the south and south-east Europe, the distance from here to the type locality of *azurea* is about 2000 km. The Chrysomelinae fauna of Iran is actively studied (e.g. Medvedev, 1975, 1983, Lopatin, 1981, 1985, Ghahari, Jedryczkowski, 2012, Mirzaei, et al., 2015). But no one could find this large and conspicuous Chrysomelid beetle in Iran again. I think the type specimens of *azurea* were erroneously labeled (see also Comm. 21).

Kippenberg (2010), without giving the type locality of *Ch. olivieri azurea*, indicates the range of this subspecies as follows: Georgia, the south of European Russia, and Turkey. However, *Ch. olivieri* is not known at all from Georgia and European Russia. As for Turkey, this species is noted only in the European part of this country (Özdikmen, 2016).

217. The members of the subgenus *Ovostoma* are distributed in the mountain regions of Central and S-E Europe (Fig. 27). Interpretation of the taxa belonging to this group by different authors is included in the fig. 28.

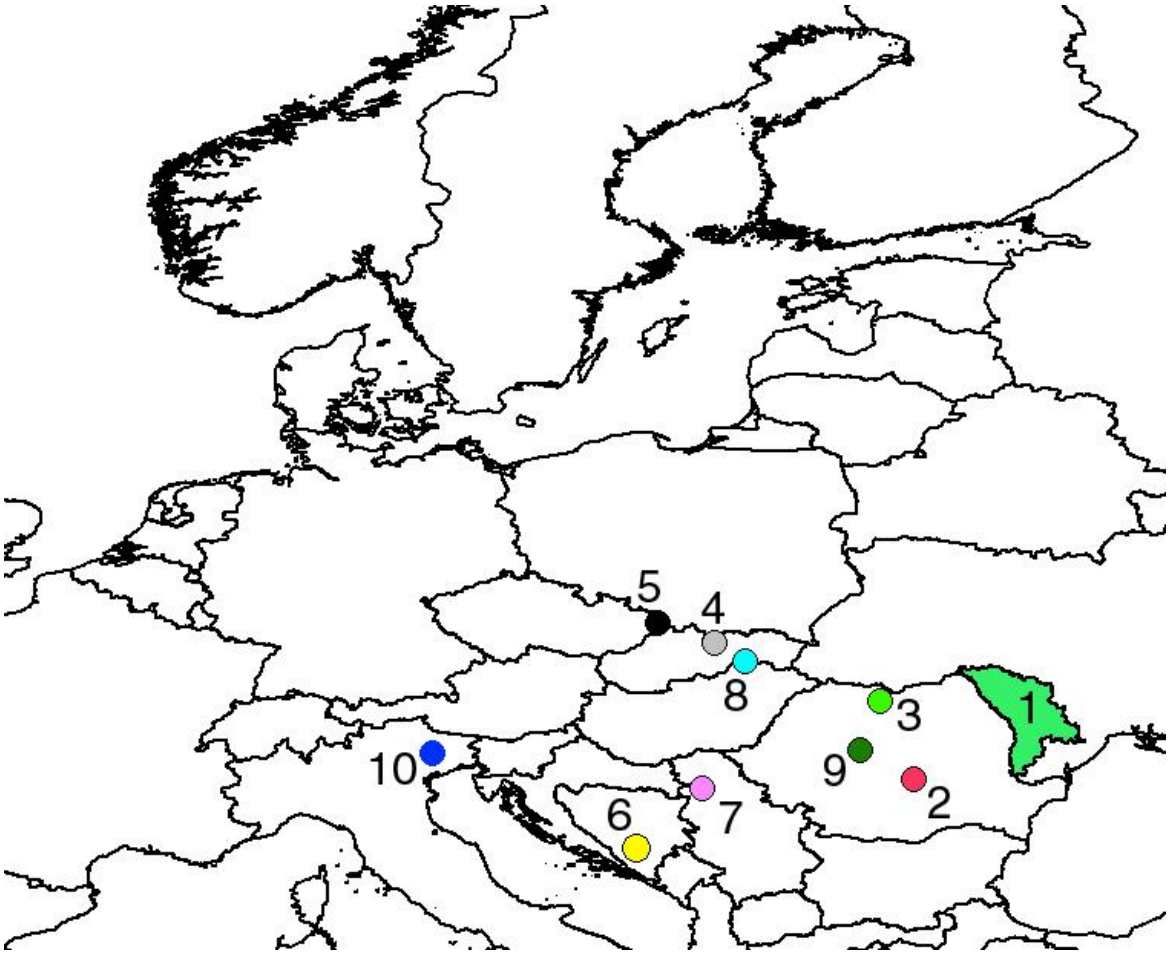


Figure 27. Type localities of the nominal taxa belonging to *Chrysolina* (*Ovostoma*) subgenus: 1 – *globipennis* Suffrian, 2 – *deubeli* Bechyné, 3 – *subalpina* Csiki, 4 – *euminuta* Bechyné, 5 – *olivieri* Bedel (= *coerulea* Olivier), 6 – *ehumerosa* Bechyné, 7 – *montanella* Bechyné, 8 – *slovaca* Bechyné, 9 – *collina* Csiki, 10 – *veneta* G. Müller.

Comments

I could not find any specimen of *Ch. olivieri* from S-E Sudetes, the exact type locality of *coerulea* (= *olivieri olivieri*) (see Comm. 218), in any Museums visited by me, including ZSM, NHMW, NME, NMP. The picture of the type specimen in Olivier (1807), which was established as a lectotype (Bourdonné, 1988a) (ICZN, 1999, 74.4), does not give a precise data on the morphology, including the taxonomic differences between the subspecies *olivieri olivieri* and *olivieri slovaca*. However, I found in ZIN (specimen from former collection by S.M. Solsky, 1831–1879) one female labeled: "German. m. ", "*Chrysomela coerulea* Dubl. ". This specimen corresponds to the recent interpretation of *Ch. coerulea* (= *olivieri olivieri*). Since the previously established lectotype (by the picture) is unsuitable for identification of subspecies, I propose to establish the neotype and refer this question to the commission on the zoological nomenclature (ICZN, 1999, 75.5).

Neotype of *Chrysomela coerulea* Olivier, 1807 is a female, 10.3 mm long, brightly bluish violet with pronotal calli blackish blue. Pronotal lateral impression developed near pronotal base, narrow, deep; pronotal lateral callus narrow, slightly broadened toward base. In light of this neotype designation, *Ch. olivieri slovaca* becomes synonym of the nominotypical subspecies.

I studied the specimens of *Ch. olivieri* from Slovakia (5 specimens, including 4 syntypes of *slovaca*), Hungary (2 specimens), Slovenia (11 specimens), Bosnia and Herzegovina (16 specimens, including syntype and topotype of *ehumerosa*), Montenegro (3 specimens), and Serbia (1 syntype of *montanella*). They are similar to each other and belong to the same taxon. The valid name for this subspecies is *Ch. olivieri olivieri*.

Paratype of *ehumerosa*, female, being at my disposal, is 9.8 mm long, elytra oval in dorsal view, pronotum with lateral sides emarginate, convergent forward in basal ½, and rounded in apical ½; elytral base slightly broader than pronotal base. The differences of the subspecies *ehumerosa* from the remaining subspecies, mentioned in the original description (Bechyné, 1950a), in body size, shape of the elytra, and the shape of the lateral sides of the pronotum are not confirmed in specimens from different places in Bosnia-Herzegovina (including the type locality). In fact, body size varies; pronotum laterally is evenly rounded and broadest basally or at mid-length, or pronotum with lateral sides almost straight (or emarginate), parallel or convergent forward in basal ½, and rounded in apical ½; elytral base is more or less broader than pronotal base.

Subspecies *slovaca* was originally described (Bechyné, 1946) in the combination with the specific name *Ch. coerulea* (= *olivieri*), although the type specimens bear the author's label "*Ch. globipennis slovaca*". This last point of view was published by the author some later (Bechyné, 1954b) and supported by Kippenberg (2010). Having studied the type series of *slovaca*, I can conclude that this taxon is closer to *olivieri* than to *globipennis*: the pronotal lateral impression is developed in the posterior ½, it is deep, sharp, and filled with large, partially merged punctures.

Subspecies *globipennis euminuta* was originally described (Bechyné, 1950a) based on the series of the specimens (ratio of the body length, 6.5–7.5 mm) from Slovakia: Strbske Pleso. The type specimens were collected by B. Springlova de Bechyné. According to the original description, this subspecies differs from the nominotypical one in: dorsal puncturation stronger, coloration dark blue (as in subsp. *deubeli* = *collina*), and smaller body size. Type specimens were deposited in the collection by J. Hlisnikovský (presently in NMP). The curator of the collection, L. Sekerka, told me that the type was probably lost. I found in NMP only one male from the type locality, collected by Obenberger. This specimen (topotype) is black with weak purple tint mixed with green from above, 6.9 mm long. It is similar to the specimens of the subsp. *collina* except the development of pronotal lateral impressions (see Review of subgenera, Subgenus *Ovostoma*).

Brovdij (1977) recorded both species, *olivieri* and *globipennis* from Moldova and the Ukrainian mountain and foothill areas of the Carpathians. *Ch. globipennis* is also noted for the

Kirovograd region of Ukraine (Trach, 2001). All specimens being at my disposal from Ukraine (7 spec.), Moldova (6 spec.), and also from the extreme east of Slovakia (the border with Ukraine, the eastern Carpathians) (2 spec.) belong to the same taxon, *globipennis*. Pronotal lateral impression varies in these specimens from completely obsolete to broad, shallow.

Perhaps such variability of the diagnostic character, which traditionally used to distinguish *olivieri* and *globipennis* (e.g. Bechyné, 1946, Mohr, 1966b, Brovdij, 1977; Warchałowski, 1993; Kippenberg, Döberl, 1994; Bieńkowski, 2004a), led to the indication of both taxa from Ukraine. Really, taxon *globipennis* occupies the northeastern part of the species range. Other forms of *olivieri* are not found there.

The taxon *globipennis* does not differ from *olivieri* in the structure of the male aedeagus, and the external differences (see Review of subgenera, Subgenus *Ovostoma*) rather indicate the existence of a geographical subspecies than a separate species. Warchałowski (1993) suggested that *globipennis* is a subspecies of *olivieri*, delimited from the rest of the species range by the rivers Tisza and Prut.

I studied 19 specimens of *Ch. olivieri* from Romania (Transylvania), including 2 males, identified by J. Bechyné as a subspecies *deubeli* Bechyné, 1948b described from Transylvania and one more male, the topotype of the subspecies *collina*. All these specimens belong to the same taxon, whose valid name should be *collina*.

Figure 28. Interpretation of the taxa belonging to the subgenus *Ovostoma* by different authors.

Bechyné, 1946, 1948b, 1950a	G. Müller, 1948	Csiki, 1953	Bechyné, 1954b	Kaszab, 1962	Warchałowski 1993, 2003	Kippenberg, 2010	Present study
globipennis Suffrian				*globipennis* Suffrian	*globipennis* Suffrian	*globipennis* Suffrian	*olivieri globipennis* Suffrian
globipennis deubeli Bechyné			*globipennis deubeli* Bechyné	*globipennis deubeli* Bechyné	*globipennis deubeli* Bechyné	*globipennis subalpina* Csiki (=*deubeli* Bechyné)	*olivieri collina* Csiki (=*deubeli* Bechyné)
		caerula var. *subalpina* Csiki	*globipennis deubeli* Bechyné (= *subalpina* Csiki)	*caerulea subalpina* Csiki	*olivieri subalpina* Csiki	*globipennis subalpina* Csiki	*olivieri collina* Csiki (= *subalpina* Csiki)
globipennis euminuta Bechyné				*globipennis euminuta* Bechyné	*globipennis euminuta* Bechyné	*globipennis euminuta* Bechyné	*olivieri euminuta* Bechyné
coerulea Olivier		*caerula* Csiki		*caerulea* Csiki	*olivieri* Bedel	*olivieri* Bedel	*olivieri* s.str.Bedel
coerulea ehumerosa Bechyné				*coerulea ehumerosa* Bechyné	*olivieri ehumerosa* Bechyné	*olivieri ehumerosa* Bechyné	*olivieri* s.str. Bedel (=*ehumerosa* Bechyné)
coerulea montanella Bechyné				*caerulea montanella* Bechyné	*olivieri montanella* Bechyné	*olivieri montanella* Bechyné	*olivieri* s.str. Bedel (= *montanella* Bechyné)
coerulea slovaca Bechyné			*globipennis slovaca* Bechyné	*caerulea slovaka* Bechyné	*olivieri slovaca* Bechyné	*globipennis slovaca* Bechyné	*olivieri* s.str. Bedel (= *slovaca* Bechyné)
		caerula var. *collina* Csiki	*globipennis slovaca* Bechyné (=*collina* Csiki)	*caerulea collina* Csiki	*olivieri collina* Csiki	*globipennis slovaca* Bechyné (=*collina* Csiki)	*olivieri collina* Csiki
	coerulea veneta G. Müller				*olivieri veneta* G. Müller	*olivieri veneta* G. Müller	*olivieri veneta* G. Müller

218. Bourdonné (1988a) writes: "L'Allemagne d'Olivier c'est celle de Frédéric II, qui comprenait les duchés de Carniole, Carynthie et Styrie, régions de l'actuelle Autriche où se rencontre *C. olivieri*". In fact, the King of Prussia from 1797 to 1840, during the period of the description of *Ch. coerulea*, was Friedrich-Wilhelm III (1770–1840). At the beginning of the 19th century, Silesia belonged to Prussia (annexed in 1742), and the territories to the south, including the Austrian Empire, were not parts of Prussia.

Only a part of the range of *Ch. olivieri* belongs to Prussia ("Allemagne") of the beginning of the 19th century, namely the extreme southeast of the Sudetes mountains in the upper reaches of the Oder river near the border of Silesia and the Austrian Empire. I propose to consider S-E Sudetes as the type locality of *Ch. olivieri* (= *coerulea*).

219. Bechyné (1955b) suggested a new subgenus *Diachalcoidea* to include three species: *sacarum* Weise (type species), *palmyrensis* Bechyné, *aegyptiaca* Olivier, and attributed to this subgenus one more species, *rufomarginata* Baly, with the question. In my opinion (see Comm. 27), there are two species: *sacarum* and *aegyptiaca* (= *rufomarginata = palmyrensis*).

Daccordi (1978b) described a new subgenus *Paradiachalcoidea* to include three species: *vignai* Daccordi (type), *copta* Daccordi (subsequently suppressed as a synonym of *limbatella* Weise) and *silvanae* Daccordi. Daccordi (1978b) noted that *Paradiachalcoidea* is similar with *Diachalcoidea* (in the original interpretation by Bechyné, 1955b) by a number of the characters: last maxillary palpomere elongate, slightly broader and distinctly longer than penultimate one, antennal insertion placed at middle between eye and clypeus, pronotal lateral callus hardly separated from disc, elytra bronze or rufous marginated laterally and apically with yellow, elytral punctures forming regular and more or less paired rows, elytral epipleuron visible along entire length in lateral view, prothoracic hypomeron weakly convex. Daccordi (1978b) also mentioned the following differences of *Paradiachalcoidea* from *Diachalcoidea*: 1) hind wings reduced, and 2) fore-, mid- and hind-tarsomeres of the same width in all tarsi in male.

Now I include *sacarum, aegyptiaca, dohrnii* in the subgenus *Diachalcoidea*. The specimens of all three species of the subgenus *Paradiachalcoidea*, being at my disposal, on external morphology and the structure of the aedeagus are very similar to the members of *Diachalcoidea*, and especially to *aegyptiaca*.

There are species with normally developed hind wings (*sacarum, aegyptiaca*) and with reduced wings (*dohrnii*) in the subgenus *Diachalcoidea*. The presence or absence of wings can not have much "weight" for the subgeneric division of the genus *Chrysolina*. Species that differ in this character are found in different subgenus, for example, *Chrysolina* s.str., *Allohypericia*, *Anopachys*, *Ovosoma*, and even in morphologically very closely related species such as *Ch. perforata* and *Ch. purpurata*.

The second distinctive feature of *Paradiachalcoidea*, mentioned by Daccordi (1978b), (fore-, mid-and hind-tarsomere of the same width in all tarsi in male) is also observed in the members of *Diachalcoidea*. Both sexes of *sacarum* and *dohrnii* and males of *aegyptiaca* have fore-tarsomeres 1–3 only slightly wider than respective tarsomeres in mid- and hind-tarsi.

Ch. (*Diachalcoidea*) *aegyptiaca* is the most morphologically close to the species of *Paradiachalcoidea*, especially to *silvanae* and *vignai*. *Ch. aegyptiaca* is widely distributed in Iran, Iraq, the Arabian Peninsula, Syria, Lebanon, Israel, Egypt, that is, in the central part of the south of "Ancient Mediterranean region" (name of the region after Kryzhanovsky, 2002). All species of the subgenus *Paradiachalcoidea* inhabit the Ethiopian Plateau. There are many representatives of Palaearctic groups of beetles in the fauna of the Ethiopian Plateau. Probably these taxa penetrated into these mountains in the geologically recent times and formed groups of closely related species there (Kryzhanovsky, 2002). Thus I think it is possible to connect *Diachalcoidea* and *Paradiachalcoidea*.

220. *Chrysomela oschanini* was originally described by Lopatin (1965) (namely, *o**sch**anini*, but not *o**sh**anini* in the subsequent publications including Lopatin (1970b; 1992a; 2010)) and compared with *koenigi* and *brevilata*, but not with *juldusana*, described earlier by the same author, I.K.

Lopatin. According to Lopatin (Lopatin, 1970b, 1992), the differences between *oschanini* and *juldusana* are as follows: 1) pronotal "lateral callus" absent in *oschanini*, weak in *juldusana*, 2) elytral puncture rows deeper in *oschanini*, shallower in *juldusana*, 3) difference in the metallic reflection of dorsal side and in color of antennae, 4) male tarsomere 1 in all tarsi less or more broadened in *oschanini* and *juldusana*, respectively. *Ch. oschanini* occurs in Kyrgyzstan from south-west to east, *Ch. juldusana* – in S-E Kazakhstan, E Kyrgyzstan, N-W China (Lopatin, 1970b). I studied holotype, paratype, and topotype of *juldusana*, syntypes of *oschanini* (*Pezocrosita* (*brevilata*) figure 7), and additional specimens from different places in Kyrgyzstan (including those identified by Lopatin as *oschanini*), S-E Kazakhstan, and N-W China and found that these taxa are conspecific. Above-mentioned distinguishing characters are within individual variability, and difference in the aedeagus structure can not be observed.

Type specimens of *oschanini* are supplied with the labels "Holotypus" (male) and "Allotypus" (female). In fact, they are syntypes because holotype was not designated in the original publication (Lopatin, 1965). Pronotal lateral impression is scarcely visible in male, and completely absent in female. Elytral epipleura are supplied with setae to the level of metasternum in the both type specimens.

221. Mikhailov (2002b) published identification key to four species of the species group *Ch.* (*convexicollis*). For the analysis of morphological features, I chose the same characteristics as Mikhailov (2002b):

A. Metric characters:

1)shape of pronotum (the ratio of the greatest width to the length in the middle) (Fig. 29),
2)width of pronotal lateral callus at base (Figs. 35),
3)width of pronotal lateral callus at the level of anterior end of basal lateral impression (Figs. 35, 36),
4)body length.

B. Qualitative characters with 2 alternative states:

5) coloration of pronotum and elytra (Fig. 33): different (1) or similar (2),
6)coloration of tarsi (Fig. 34): dark brown (1) or rufous (2).

C. Qualitative characters with continuous variability. "Standard specimens" were selected to describe these characters. Specimens with the most obvious manifestation of the character are used as "standard" ones:

7)punctures at pronotal disc (Fig. 30): (1) fine (typical of *convexicollis*, after Mikhailov, 2002); (2) medium-sized (typical of *erzinica*, after Mikhailov, 2002b); (3) large (typical of *urjanchaica*, after Mikhailov, 2002b),
8)secondary elytral punctures (= punctures in elytral intervals) (Fig. 31): (1) small (typical of *convexicollis*, after Mikhailov, 2002b); (2) medium-sized (typical of *erzinica*, after Mikhailov, 2002b); (3) large (typical of *urjanchaica*, after Mikhailov, 2002b),
9)sutural furrow at elytral apical slope (Fig. 32): (1) absent (typical of *convexicollis*, after Mikhailov, 2002b); (2) very feeble (typical of *convexicollis*, after Mikhailov, 2002b); (3) distinct (typical of *erzinica*, after Mikhailov, 2002b).

All males were identified by aedeagus structure. Females were related to the species, if they have been collected together with the respective males.

Figure 29. Shape of pronotum.

species	ratio of the greatest width to the length in the middle (number of specimens)				total number of specimens
	1.9 X	2.0 X	2.1 X	2.2 X	
convexicollis	2	20	7		29
erzinica		2			2
ulugkhemica	3	7	8	2	20
urjanchaica	3	3			6

Figure 30. Punctures at pronotal disc.

species	fine	medium-sized	large	total number of specimens
convexicollis	22	6	1	29
erzinica	1	1		2
ulugkhemica	11	8	1	20
urjanchaica			6	6

Figure 31. Secondary elytral punctures.

species	fine	medium-sized	large	total number of specimens
convexicollis	25	4		29
erzinica		2		2
ulugkhemica	12	8		20
urjanchaica		3	3	6

Figure 32. Sutural furrow at elytral apical slope.

species	absent	very feeble	distinct	total number of specimens
convexicollis	1	10	18	29
erzinica			2	2
ulugkhemica	1	8	11	20
urjanchaica			6	6

Figure 33. Coloration of pronotum and elytra.

species	different	similar	total number of specimens
convexicollis	14	15	29
erzinica	2		2
ulugkhemica	6	14	20
urjanchaica	6		6

Figure 34. Coloration of tarsi.

species	dark brown	rufous	total number of specimens
convexicollis	15	14	29
erzinica	1	1	2
ulugkhemica		20	20
urjanchaica	5	1	6

Figure 35. Width of pronotal lateral callus at the base.

species	ratio of the basal width of callus to the width of pronotum (number of specimens)							total number of specimens
	0.14	0.15	0.16	0.17	0.18	0.19	0.20	
convexicollis	4	9	7	5	3	1		29
erzinica			1	1				2
ulugkhemica			3	4	6	5	2	20
urjanchaica	2	2	2					6

Figure 36. Shape of pronotal lateral callus.

species	callus broadened toward base	callus not broadened toward base	total number of specimens
convexicollis	10	19	29
erzinica		2	2
ulugkhemica	14	6	20
urjanchaica	4	2	6

Thus, only a size of the punctures at pronotal disc (Fig. 30) is more or less suitable external character for distinguishing between the species: these characters permit us to separate most specimens of *Ch. urjanchaica* from the others. However, this character is not discrete and difficult for reliable identification. Besides that, *Ch. urjanchaica* and *Ch. ulugkhemica* are scarcely different by the width of pronotal lateral callus. However, this character does not permit to separate these two species from the others. At present, females of the species group *Ch.* (*convexicollis*) could not be precisely identified.

222. Distinguishing characters of *Ch. glebi* and *Ch. helenae* after Lopatin (1968a, 1988, 2010) are presented below (Fig. 37). I studied the type specimens of both, *helenae* and *glebi*, together with 15 additional specimens from different localities (*Pezocrosita* (*cyanopurpurea*) figures 1–7). The characters listed below vary in these beetles independently of each other and do not allow distinguishing two species. Tarsi are rufous, light brown, pitchy brown, or black. Antennae are entirely light rufous, light rufous with antennomere 1 mostly black, or black with antennomeres 1 and 2 rufous below at apex. Shape of pronotal lateral sides varies: from regular arc-shaped till arc-shaped anteriorly and almost straight (or even slightly emarginate) near base. Accordingly, the greatest width of pronotum is in different places. The punctures of the pronotal disc vary greatly in size even in the simultaneously collected beetles. Elytral puncture rows are regular, partly irregular,

or doubled (in this case, each of usual row 2, 3, 4 replaced by two undulate and partly irregular rows). Punctures of elytral intervals vary greatly in size. Apical triangle of aedeagus varies in length. It even happens that beetles with rufous tarsi (as described for *glebi*) have apical triangle much shorter, than in the type specimen of *helenae* (although it should be long in *glebi*). Convex callus at the ventral side of apex of aedeagus is differently developed. Thus, I believe *glebi* and *helenae* to be conspecific.

Figure 37. Distinguishing characters of *Ch. glebi* and *Ch. helenae* after Lopatin (1968a, 1988, 2010).

Characters	*Ch. helenae*	*Ch. glebi*
coloration of tarsi	pitchy black	light rufous
coloration of antennae	antennomeres 1, 2 rufous below, others entirely dark	light rufous
pronotal lateral sides	regularly and very slightly rounded	distinctly rounded
maximal width of pronotum	behind mid-length of lateral side (after the figure by Lopatin)	at mid-length of lateral side (after the figure by Lopatin)
ratio: pronotal width / length	1.8 X	1.6 X
punctures on pronotal disc	larger and deeper	very fine and sparse
ratio: elytral length / pronotal length	2.7 X	2.5 X
elytral puncture rows	less distinct, shallow, irregular	distinct, deep, regular near suture, curved and partly confused at middle
elytral intervals	moderately or sericeous shining, covered by punctures of different size, partly as large as those in the rows	shining, smooth, covered by fine sparse punctures
apex of aedeagus	wide-angle, thickened	triangular, not thickened
apex of aedeagus ventrally	without convex callus along the middle	with convex callus along the middle

223. G. Kraatz included in the original description of *Orina dolens*, besides three typical specimens from Samarkand, one specimen of unnamed variation as follows: "Var.: Olivacea, subcupreola, subtus etiam olivacea. – Namangan" (Heyden, Kraatz, 1885). Lopatin (1972) designated one specimen from Samarkand as a lectotype. Thus, a specimen from Namangan becomes a paralectotype. I identify it as *Ch. tshatkalica*.

224. I examined the specimens of both, *Ch. obovata* and *Ch. almaatica* and found that these allopatric taxa differ from each other only by body coloration and, insignificantly, by the depth of

lateral impression at pronotal base. They have similar aedeagus. Thus, I consider *obovata* and *almaatica* to be subspecies. Lopatin (1970b) pointed that these taxa are close to each other.

225. The label of the type specimens of *Ch. aeneomicans* Chen, 1934 mentioned in the original description as follows: "Yunnan: Pe-Yen-Tsin (P. Siméon, au Muséum de Paris)". I received from MNHN a female with the labels: "TYPE" / "Museum Paris. Chine merid P. Guerry 1924" / "P. Guerry Roanne" / "*aeneomicans* Chen S.H.Chen det.". Different names of collectors and some different localities do not represent a contradiction, since, for example, syntypes of *Apophylia epipleuralis* Laboissière, 1927 have a label: "Museum Paris Yunnan S-O 24°N Pe-Yen-Tsin (Mines de Sel) (Père Simeon Ten) P.Guerry 1924" (Bezdek, 2003). That is the same expedition. A syntype of *aeneomicans* being at my disposal fully corresponds to the original description (Chen, 1934).

226. I examined two topotypes of *Chrysolina annamensis* from "Annam: Tanh-Hoa" identified by M. Daccordi, 1979. They fully correspond to the original description. There is no information on the presence / absence of denticles on the 4th tarsomere in the original description (Chen, 1934). Kimoto, Gressitt (1981) note for this species: "claw segment of tarsus feebly toothed beneath". However, available specimens have not the denticles. Kimoto, Gressitt (1981) were mistaken because they did not study the type of *annamensis* or any other specimens of this species, and the character in question was given in their key, apparently, after Bechyné (1950a). Bechyné (1950a) included *annamensis* in the species group in which "Article onguéal des tarses faiblement denticulé." But Bechyné (1950a) examined only a non-type specimen from Annam (Achard coll., NMP), did not describe its characters or comparison with the type or the original description of *annamensis*. Perhaps it was a specimen of another species.

I examined a holotype of *Chrysolina* (*Pierryvettia*) *vitalisi* Bechyné, 1950a (*Pierryvettia* figure 8). It fully corresponds to the original description of this taxon, and also corresponds to the original description and topotypes of *annamensis*.

227. *Chrysolina ceylonica* was originally described based on two specimens labeled "Ceylon" without more precise information. I studied one of them (*Pierryvettia* figures 14–16). It fully corresponds to *Ch. stictica* (including last maxillary palpomere distinctly narrower than penultimate one, and 4th tarsomeres with denticles) which is described from Java and common there. On the other hand, noone found *Ch. ceylonica* on Sri Lanka once more. Only one species of subgenus *Pierryvettia*, namely *Ch. separata*, lives in Sri Lanka. This gives me reason to consider that the type label of *ceylonica* is incorrect, and this taxon is a synonym of *stictica*.

228. I consider the characters of *Ch. conglomerata* on the basis of the original description, Maulik (1926). I have at my disposal numerous specimens of this taxon from Nepal and E India.

Ch. helferi was described based on the single specimen (female, holotype) from Myanmar (Bechyné, 1950a). I compared holotype of *Ch. helferi* (*Pierryvettia* figure 4**)** with available specimens of *Ch. conglomerata* and found them to be conspecific. Bechyné (1950a) indicated, that body of holotype of *Ch. helferi* is 9 mm long. I measured this specimen under a binocular microscope with a measuring eyepiece. In fact, it is 7.6 mm long.

229. Medvedev (1987), when he described *Ch. shapaensis*, also indicated that this species apparently was recorded by Takizawa (1980) (according to the figure in the publication of the latter) from the Himalayas under the name *Ch. aurata*. I have seen the specimens of *Ch. shapaensis* from Vietnam only.

230. *Ch. separata* is widely distributed in S and S-E Asia. I studied: 10 males and 1 female from Vietnam including type of *indosinensis* (two taxa, *indosinensis* and *tonkinea* were described from Vietnam), 5 males and 14 females from N and N-E India including type of *perforata* Redt. (two taxa, *separata* and *perforata* were described from that region), 6 males and 3 females from Myanmar (*grutii* was described from Myanmar), 1 female from Nepal, 2 males and 5 females from Sri-Lanka, 1 male from Thailand (*siamensis* was described from Thailand), 4 males and 2 females from S India (*aurata* was described from that region) (*Pierryvettia* figures 23–26, 34, 36, 37).

Available specimens vary in size and coloration of body, density and size of pronotal punctures, size and degree of ordering of elytral punctures. The shape of the aedeagus varies little (apical projection is more or less separated by lateral impressions). However, I could not distinguish any geographical forms in *Ch. separata*.

231. Suffrian (1851) in the original description of *Chrysomela aurata* only presumably refers this species to the fauna of the Oriental region. Jacoby (1896) refers the specimens from the collection by Baly to *Ch. aurata* and specifies the type locality: Belgaum, Canara – in S India.

232. I have not the opportunity to study a type specimens of *Ch. annamensis*. Three available specimens (topotype of *annamensis*, specimen identified as *annamensis* by M. Daccordi, and holotype of *Ch. vitalisi*) correspond to the original description of *annamensis* except their body length. After the original description, Chen (1934), *Ch. annamensis* is 8–8.5 mm long, and available specimens are 6.4–7.0 mm long.

233. *Ch. novozhenovi* is known from four localites in Sayans and collected together with *Ch. sylvatica* in all places (Mikhailov, 2007a). *Ch. novozhenovi* differs from *Ch. sylvatica* only by the shape of internal sack of aedeagus (endophallus), a character not sufficiently studied in *Chrysolina* species and with unstudied intraspecific variability. Brinev, Zimina (2002) found significant intrapopulation variability of the structure of internal sack during the process of the physiological development in adult of *Carabus regalis* (Fischer-Waldheim, 1822).

234. A record of *Ch. sylvatica* from Podkamennaya Tunguska river, at "7–verst threshold" (also known as the Great Threshold), based on the single examined female, is the most northern locations of the species, 600 km to the north of the well-known area.

235. I examined a holotype, male of *Ch. orientalis thraeissa* (*Ovosoma* figure 69**)**. It has aedeagus exactly the same as in the neotype of *Ch. orientalis*, hind wings very short, invisible under the elytra, dorsum moderately shining, black with weak violetish bronze tint, elytral colored spots very narrow and barely protruding out of the punctures, pronotal lateral sides mostly straight and narrowly rounded only at the very top. It falls within the limits of the variability of the *Ch. orientalis* series from Bursa.

236. Having examined a holotype of *Ch. baicalica* Mohr (MNHUB) (*Jeanclaudia* figures 15–17) and topotypes of *Ch. cyaneovinosa* L.Medvedev (ZIN), I found that *baicalica* is conspecific not with *undulata* as it was considered before (Bieńkowski, 2001; Kippenberg, 2010), but with *cyaneovinosa*. Therefore, *baicalica* Mohr is a senior synonym of *cyaneovinosa*. Features of *Ch. baicalica* based on the holotype are: dorsum weakly shining, violet; elytral puncture rows strongly paired (distance between 3rd and 4th rows in the middle part is 2.3 X greater than the distance between 4th and 5th rows in the same place) – this is the difference from *Ch. undulata*. Strongly paired elytral rows were mentioned in the original description of *baicalica* (Mohr, 1966a). The

species was named "*baicalica*" [from the name of Baikal lake], although the author, Mohr (1966a) noted that he described it by one male without a geographical label. In fact, the area of this taxon is in the Central Yakutia.

237.Taxon *soluta* was treated to be a synonym of *sexlineata* by Weise (1916) and Bieńkowski (2001). I studied a syntype of *sexlineata* (*Chersomela* figures 162–163**)**, one additional specimen corresponding to the original description, and 10 specimens corresponding to the original description of *soluta*. The original description of *soluta* includes details of the coloration, in particular, the arrangement of elytral yellow bands: "1ma inter strias 2. et 3. a basi ultra medium, et inter strias 3. et 4. a medio ad apicem, 2nda inter strias 6. et 7. ab humeris ultra medium, et inter strias 7. et 8. a medio juxta sed haud attingente apicem, 3tia ab humeris inter striam 10, et marginem usque ad apicem), basi quoque (a scutello ad humeros) flavo" (Clark, 1864). On the other hand, in *sexlineata*, each of three yellow bands occupies one elytral interval. Available specimens of *soluta* represent a variability of the color (reduction of some of the yellow bands) (*Chersomela* figures 167, 168, 174, 175**)**, but have not the pattern characteristic of *sexlineata*. Thus I consider *soluta* to be a separate species but not a synonym of *sexlineata.*

238. The name *vigintimaculata* Clark, 1864 was originally suggested in a combination with the generic name *Polysticta*, but the name *vigintimaculata* Chevrolat, 1833 – in a combination with the generic name *Chrysomela*. Vogel (1870, 1871) considered *Polysticta* to be a subgenus of *Chrysomela*. Thus *vigintimaculata* Clark, 1864 became a secondary junior homonym of *vigintimaculata* Chevrolat, 1833. Because of that, Vogel (1871) suggested a new replacement name *Chrysomela* (*Polysticta*) *vicenaria* for *vigintimaculata* Clark, 1864, and wrote about that in the last paragraph of the essay devoted to this species, page 102.

The junior secondary homonym (*vigintimaculata* Clark), replaced before 1961, should be considered invalid (ICZN, 1999, 59.3), except for cases when: 1) the substitute name is not used as a valid one [in fact, still Weise (1916) considered *vicenaria* to be an invalid synonym of *vigintimaculata* Clark], and 2) both homonyms are not treated as the members of the same genus (presently, *vigintimaculata* Chevrolat is included in the genus *Calligrapha* Chevrolat, 1837). Thus, *vigintimaculata* Clark, 1864 should be considered to be a valid one.

239. Collection by C.P. Thunberg (1743–1828) (UUZM) includes two specimens with the original label "*20–pustulata*". One specimen, labeled by M. Daccordi as "Lectoholotypus" (designation unregulated by ICZN, 1999), corresponds to the original description: "Ovata atra capite thoraceque flavo-maculatis, elytris punctis viginti luteis" (Thunberg, 1787). I consider it to be a syntype (*Chersomela* figures 112**)**. It is conspecific with *pardalina*. Another specimen, labeled by M. Daccordi as "Lectoparatypus", does not correspond to the original description because it has black elytra, each with four yellow spots laterally and two more spots interiorly (one behind humerus, and another at apical slope), and can not be considered to be a syntype of *vigintipustulata* Thunberg. This specimen is conspecific with *revestita*.

240. I studied original descriptions of all taxa included in *Ch. pardalina*, type specimens of *Chrysomela vigintipustulata* Thunberg and *Ch.* (*Polysticta*) *revestita* Vogel, and 165 more specimens. I came to conclusion about the existence of a single polymorphic species. Genital differences are not found in the specimens examined. Coloration of 4 abundant forms and 3 rare ones is given in the Fig. 38. In addition, non-intersecting rows of variability in the pronotal pattern are found for each of three most common color forms (*Chersomela* figures 91–93, 99–102, 104–109).

Figure 38. Variability of *Ch. pardalina.*

characters	Ab. *revestita* Vogel	*pardalina* Fabricius s.str.	Ab. γ (*pardalina*): Vogel	Ab. *vigintiguttata* Clark	Ab.?	Ab.?	ab. *subcruciata* Clark	ab. *undata* Fabricius
color of pronotum	yellow or rufous with black pattern	yellow or rufous with black pattern	yellow or rufous with black pattern	red with black pattern	entirely black	red with black pattern	yellow or rufous with black pattern	black with yellow pattern
yellow pattern of elytron	mostly irregular lateral stripe	10 rounded spots (4 lateral ones connected to each other)	10 rounded spots (4 lateral ones connected to each other)	10 rounded spots (4 lateral ones mostly separated)	10 rounded spots (4 lateral ones separated)	10 rounded spots (4 lateral ones separated)	mostly yellow, with black pattern nearly cruciate	mostly yellow, with black pattern nearly cruciate
color of prothoracic hypomeron except outer stripe	black	black	black	red	black	red	black	?
color of outer stripe of prothoracic hypomeron	yellow	yellow	yellow	red	black	red	yellow	?
color of femur	black	black	rufous with base and apex black	red with base and apex black	black	black	black	rufous with base and apex black
color of head below	black	black	black	red	black	red	black	?
specimens examined	21	35	13	90	5	1	3	1 (after M. Daccordi, pers. comm.)

241.The name *cribrosa* Thunberg was considered to be a junior synonym of *Ch.* (*Atechna*) *striata* (= *fasciata*) by Weise (1916), and then cited by Bieńkowski (2007a). Having examined a type specimen of *cribrosa* Thunberg (*Chersomela* figures 148, 149), I found that this taxon differs from the members of the subgenus *Atechna* by the shape of elytral epipleura (almost horizontal, especially anteriorly), setation (setae present only at apex of epipleura), and elytral color pattern (more or less rounded, partly merged spots, crossing several puncture rows). Aedeagus of type specimen of *cribrosa* looks like that of *Ch.* (*Atechna*) *striata*, however, several member of the subgenus *Ch.* (*Chersomela*) have aedeagus of similar shape too. I think that *cribrosa* belongs to the subgenus *Ch.* (*Chersomela*) A name *cribrosa* Thunberg is invalid because of homonymy. Senior available name for this taxon is *repanda* Wiedemann. The type of the latter was studied by M. Daccordi (unpublished data), who came to the opinion of the conspecificity of *repanda* and *cribrosa*.

I studied an original description and type specimen of *progressa* and agree with M. Daccordi (unpublished data), who considered this name to be a synonym of *repanda*.

242. Collection by C.P. Thunberg includes two specimens under the name *Chrysomela bipustulata*. One specimen is a Chrysomelid-beetle, corresponding to the original description by Thunberg (1787) (*Chersomela* figure 231**)**: "Ovata atra, elytris margine punctis duobus rubris". It is conspecific with *Ch. vulpina*. Another specimen belongs to the family Nitidulidae. It has elytra without rufous lateral margin, and with only two rufous spots and corresponds to the original description of *Coccin*. [*ella*] *bipustulata* Thunberg, 1784: 22: "<...> macula elytrorum simplici, nec composita ex maculis tribus confluentibus. thoracis marginibus luteis. <...>". The latter was erroneously suppressed as a synonym of ladybird *Hyperaspis reppensis* (Herbst, 1783) (Kovář, 2007).

243. Vogel (1870, 1871) considered *Polysticta figurata* Clark, 1864 to be a member of the genus *Chrysomela* and suggested a new replacement name *Chrysomela varivestis* for this taxon because of the secondary homonymy with *Doryphora figurata* Germar, 1823 (the latter was treated by Stål (1862) as *Chrysomela figurata* (Germar)). Subsequently, the name *figurata* Germar was published by Weise (1916) as *Doryphora figurata* and then (Bechyné, 1952c) as a valid name *Stichotaenia figurata* (Germar).

Replacement name *Chrysomela varivestis* Vogel is not used as a valid one since Weise (1916) (it was cited as an invalid junior synonym of *Chrysomela figurata* Clark). According to ICZN (1999, 59.3 and Example), the name *figurata* Clark is a valid.

244. Daccordi (1994) included *Chersomela* in the genus *Chrysolina* as a subgenus of the latter. Thus, *Chersomela hottentotta* Weise, 1914 became a secondary junior homonym of *Chrysomela hottentotta* Fabricius, 1792 (the latter is an junior synonym of *Chrysolina haemoptera* (Linnaeus, 1758)). The name *Chrysomela hottentotta* Fabricius was not treated as a valid name, at least, since Gemminger, Harold (1874) (*hottentotta* Fabricius was cited there to be a synonym of *Chrysomela haemoptera* Linnaeus). Therefore, the name *Chrysolina hottentotta* (Weise, 1914) should be considered as a valid one (ICZN, 1999, 23.9.1). However, the requirements of Article 23.9.1.2 are not respected because there were not 10 authors who wrote in 25 works on the *Chrysolina* fauna of Namibia, where *Chrysolina hottentotta* (Weise) occurs. The question of the suppression of the senior homonym *Chrysomela hottentotta* Fabricius, 1792 should be referred to the Commission on Zoological Nomenclature (ICZN, 1999, 23A).

245. I examined the type specimens of both *Chrysomela lineoligera* Vogel from S Africa and *Paropsis venustula* Chapuis (*Chersomela* figure 62) described from Australia together with additional specimens and agree with M. Daccordi (unpublished data) that they are conspecific. Therefore, a type locality of *Paropsis venustula*, Australia, is probably incorrect.

246. *Chrysolina oberprieleri* Daccordi in litt. was firstly mentioned by Jolivet, Petitpierre, Daccordi (1986), and then cited as a described species by Scott, Adair (1990), Sindel (1996), Clarke (2001) (https://digital.library.adelaide.edu.au/.../02whole), Biocontrol of weeds history..., (2011), Invasive Species Compendium: Datasheets, maps, images, abstracts and full text on invasive species of the world (2017). This taxon was introduced from South Africa to Australia as test object for the biocontrol of allied plant *Chrysanthemoides*, but it is not described till now.

247 M. Daccordi (unpublished data) studied types of both *interruptofasciata* and *pulchella* and found them to be conspecific. I examined a syntype of *interruptofasciata* (*Chersomela* figures 136, 137**)**, original description of *pulchella* and picture of the type of the latter made by M. Daccordi (*Chersomela* figure 135**)**, as well as additional specimens, and agree with him.

248. I studied the original descriptions of both *Polysticta eburnipennis* Clark, 1864 and *Chrysomela* (*Polysticta*) *palliata* Vogel, 1870, together with a type of the latter (*Chersomela* figure 22**)** and 28 additional specimens. I believe *eburnipennis* and *palliata* represent color variations of the same species, as it was mentioned by Vogel (1871): elytra yellow with black spots in the former (unknown to Vogel) or black with yellow spots in the latter.

249. A type locality of *Ch. hebe* was not indicated originally. I examined types and original descriptions of both *Chrysolina* (*Polysticta*) *tortuosa* Bechyné, 1948a and *Chrysolina* (*Polysticta*) *tortuosa quangoensis* Bechyné, 1948a (*Chersomela* figure 46**)**, compared them with the original description and additional specimens of *Ch. hebe* and found all these names to be conspecific. All specimens being at my disposal were collected in Angola. Therefore, Angola should be considered as a type locality of *Ch hebe* (ICZN, 1999, 76A. 1.4).

250. I studied an original description of *Chrysomela africana* Jacoby, 1898 and specimens corresponding to that. Aedeagus of *africana* and *tricolor* is similar (holotype of the latter was studied by M. Daccordi, unpublished, *Chersomela* figure 179). I think, *africana* to represent an aberration (entirely metallic, unicolorous) of the species polymorphic in coloration.

251. *Polysticta macularis* Clark, 1864 is a member of the genus *Centroscelis* (Vogel, 1870, 1871; Weise, 1916) and synonym of *Centroscelis notata* (Fabricius, 1781) (Bezděk, Daccordi, Kantner, 2012)

252. Examination of two syntypes of *Chrysomela* (*Polysticta*) *Clarki* var. *Malvernensis* Achard shown that this taxon is not an aberration of the species Ch. *clarkii*, as believed Bechyné (1952a), but conspeific with *Ch. semirufa* Fairmaire and possesses all the features of the latter: elytron with rufous lateral stripe along entire length, two lateral yellow spots fused with this stripe; elytron with 4 very large yellow spots (2, 2); clypeus glabrous, lateral sides of vertex covered by sparse, thin setae; apical margin of 4^{th} tarsomere drawn in the form of 2 fine denticles ventrally; head and pronotum rufous; underside including elytral epipleura rufous).

253. Yang (2014) studied a syntype of *Ch. jacobyi* and pictured an aedeagus. I studied original descriptions of both *Ch. jacobyi* and *Ch. pavlenkoi*, together with additional specimens from the Russian Far East (Primorsky Krai), Korea, and China and came to conclusion that these two taxa are conspecific. Medvedev (1992a) in the key to *Chrysolina* of the Russian Far East presented the features of *Ch. jacobyi*, including a figure of aedeagus, under the name *Ch. pavlenkoi*.

254. I examined the original descriptions and syntypes of *sierrana* (*Stichoptera* figures 4, 18, 19**)** and *decipiens* , additional specimens from Portugal and Spain, compared them with topotype of *lucidicollis* (from Sardinia) and additional specimens of the latter from Algeria, Libya, Tunisia, and Morocco and found all of them to be conspecific. Taxa *rufohumeralis* and *latecincta laboissierei*, considered before as synonyms of *decipiens*, belong to the same species.

Franz (1958) transferred one syntype (male) of *decipiens* to the syntypes of *sierrana*. Therefore, *decipiens* and *sierrana* are objective synonyms.

255. The name *Ch. sanguinolenta* var. *epipleurica* is usually considered as a subspecies of *Ch. latecincta* (after Bechyné, 1950a; Kippenberg, 2010) or synonym of *Ch. sanguinolenta* (after Weise, 1916). I examined a syntype of var. *epipleurica* (*Stichoptera* figure 26). It is a male with aedeagus similar to that in *Ch. kuesteri*, lateral ½ of outermost elytral interval rufous, pronotum with weak lateral impression, slightly deepened basally, but not forming a furrow, dorsum black, elytra with dense irregular punctures and wrinkled intervals. I believe, it is conspecific with *Ch. kuesteri*. Specimens of *Ch. kuesteri* from Iberian Penins. belong to the subspecies *kuesteri friderici*. Therefore, *epipleurica* is a senior synonym for *friderici*.

256. Examination of four syntypes of *holdhausi*, 13 syntypes of *norica* (*Stichoptera* figures 12, 13**)**, together with 27 additional specimens shown the conspecificity of these names: elytra slightly more wrinkled in "*holdhausi*" than in "*norica*", however this difference is within individual variability.

257. The subspecies of *Ch. kuesteri* differ from each other by the elytral puncturation as follows (Warchałowski, 2003):

1(2) Elytral punctures usually finer, with intervals mostly broader than punctures. Subspecies from W Europe except Iberian Penins. Length 7.6–9.5 mm.

Ch. kuesteri kuesteri

2(1) Elytral punctures usually larger, with intervals mostly as wide as punctures or narrower. Subspecies from Iberian Penins. Length 7.8–9.5 mm.

Ch. kuesteri epipleurica (= *friderici*)

I chose two "reference" specimens, in which the difference was the most clear: one with fine elytral punctures (from the area of *kuesteri kuesteri*) and another with large elytral punctures (from the area of *kuesteri epipleurica*). I compared all available specimens with these "reference" ones and received the following results (Fig. 39). This difference is almost sufficient (or slightly insufficient) for separation subspecies.

Figure 39. Variability of elytral punctures in *Ch. kuesteri.*

area	total number of specimens	with fine punctures	with large punctures
France, Germany, Austria, Hungary, Poland	23	18 (78%)	5 (22%)
Portugal, Spain	34	11 (32%)	23 (68%)

258. I examined a syntype (female) of *Ch.* (*Naluhia*) *exaequata* in NMP: dorsal coloration variation № 3 (see Review of the subgenera, *Naluhia*), elytra entirely metallic green, legs entirely black with blue tint, elytra covered by regular rows of dense similar punctures. Based on these characters, I consider the name *exaequata* to be a synonym of *Ch. simonsi*, although Daccordi (1980c) suppressed *exaequata* as a synonym of *Ch. nigromaculata verhulsti.*

259. Recent authors (Bechyné, 1950a; Warchałowski, 2003; Kippenberg, 2010) distinguish five subspecies within *Ch. herbacea* as follows: nominotypical one to include 13 available invalid synonyms, and four more subspecies without synonyms. Distinctive features of the subspecies, according to literature data, are presented in Fig. 40. I will analyze below only valid taxa to date.

1) *herbacea* Duftschmid, 1825 was described from S-E Austria based on unrecognized number of specimens. The original interpretation of *Chrysomela herbacea* can not be clearly established. Original description does not include the main diagnostic characters as shape of elytral epipleura (visible or invisible from lateral side) and aedeagus structure. However, the author noted: "Die Mitte des Halsschilded fast glatt, seine Seiten mit eingedrückten gröberen Puncten". It only partly can correspond to the recent interpretation of *Ch. herbacea* and is more like *Ch. viridana*. The collection by C. Duftschmid was integrated into the Linz Museum, but the type specimens can not be identified in this collection (Gusenleitner, 1984). Interpretation of *herbacea* in the subsequent literature was different. Suffrian (1851) did not mention *herbacea* at all. Weise (1884a) and Marseul (1886) considered *herbacea* as a variation of *menthastri* (while the former elder than the latter!). Reitter (1913) considered *herbacea* as an aberration of *coerulans.* Weise (1916) noted that *herbacea* is an aberration of *menthastri*. Ter-Minasian (1950), Medvedev, Shapiro (1965), Mirzoeva (1988) used the name *menthastri* as a valid one and did not mention *herbacea*. Bechyné (1950a), apparently, was the first who used the name *herbacea* in the modern interpretation. He was followed by most recent authors, e.g. Mohr (1966b), Brovdij (1977), Lopatin (1977, 1986, 2010), Gruev, Tomov (1986), Kasap (1988), Silfverberg (1992), Warchałowski (1993, 2003), Kippenberg, Döberl (1994), Lompe (2002), Bieńkowski (2004a), Lopatin, Nesterova (2005), Borowiec (2007–2018), Isaev (2007), Kippenberg (2010). I designate a neotype of *Chrysomela herbacea* Duftschmid to confirm the modern interpretation of this name. The neotype (male) was collected in the type locality, Austria (Styria). It wholly corresponds to the recent interpretation of the name *herbacea* (dorsum green with golden tint more distinct at elytra, pronotum without lateral impression, laterally with numerous large and slightly wrinkled punctures, medially with numerous punctures as large as those at elytral apical slope, elytral epipleura invisible in lateral view in apical ⅓, apex of aedeagus broadly truncate and slightly rounded, length 8.0 mm (*Synerga* figure 12).

2) *herbacea alacris* Bechyné, 1950a was described based on unrecognized number of specimens from Taurus Mountains in S Turkey. I have at my disposal nine syntypes and a number of additional specimens from Turkey including those from Taurus Mountains.

3) *herbacea caucasica* (Motschulsky, 1860a) was described based on unrecognized number of specimens from the Caucasus ("les Alpes du Caucase" after the original description). The single type specimen found in the Motschulsky collection (ZMMU) bears an original label "b. Tiflis" [bei Tiflis = near Tbilisi]. Thus, the type locality can be clarified: Georgia, Tbilisi (ICZN, 1999, 76A.1.1.). Besides the type specimen, I have additional specimens from Georgia.

4) *herbacea recticollis* (Motschulsky, 1860a) was described based on unrecognized number of specimens from Armenia and Asia Minor. The author noted that he had one more specimen from Portugal. All specimens, mentioned by Motschulsky (1860a), should be considered to be the syntypes. I found in Motschulsky collection (ZMMU) four type specimens. Two of them bear label "Armenia", others are without labels. Because of that Asia Minor is a type locality of another

subspecies, and a population from Portugal can strongly differ from that from Armenia, I designate a lectotype (male) of *recticollis* from Armenia. Besides the type specimens, I examined additional specimens from Armenia.

5) *herbacea talyshana* Bechyné, 1950a was described based on unrecognized number of specimens. Bechyné (1950a) mentioned some differences between males and females and several places of the deposition of the type series. The author listed in the original description the several locations, however specifically attributed Talysh (the extreme south-east of Azerbaijan) as a type locality. I examined two syntypes and additional specimens from Azerbaijan.

Besides that I studied a syntype of *Chrysomela fulgida* Motschulsky, 1860a (it was described from Sicily Isl.) and additional specimens from that Island. I confirm that it is a synonym of *Ch. herbacea*.

Figure 40. Characters of the subspecies of *Ch. herbacea* after literature sources (beginning).

character	*herbacea*	*recticollis*	*caucasica*	*alacris*	*talyshana*	Reference
length (mm)		6.8–9.3	smaller than *recticollis*			Motschulsky, 1860a
	females slightly longer than males	8.0–9.5		females much longer than males	8.5–11.0	Bechyné, 1950a
	7.0–10.5				8.5–11.0	Warchałowski, 2003
elytral punctures		weak	strong			Motschulsky, 1860a
			fine	weaker and sparser than in *herbacea*		Bechyné, 1950a
				finer than in *herbacea*		Warchałowski, 2003
elytral shape			nearly parallel-sided		nearly parallel-sided at mid-length	Bechyné, 1950a
			sides subparallel			Warchałowski, 2003
body shape		broader than *herbacea*	narrower than *recticollis*			Motschulsky, 1860a
		broader than *herbacea*	much narrower than *recticollis*			Bechyné, 1950a
		more slender than in others				Warchałowski, 2003

Figure 40. Characters of the subspecies of *Ch. herbacea* after literature sources (continuation).

character	*herbacea*	*recticollis*	*caucasica*	*alacris*	*talyshana*	reference
elytral puncture rows		almost regular				Motschulsky, 1860a
		more regular than in *herbacea*				Bechyné, 1950a
pronotum shape		longer than in *herbacea*	very transverse			Motschulsky, 1860a
pronotum laterally		more narrowed foreward than in *herbacea*				Motschulsky, 1860a
pronotal corners		more projecting and sharp than in *herbacea*	slightly projecting			Motschulsky, 1860a
shape of pronotum lateral sides		straight in basal ½	straight in basal ½			Motschulsky, 1860a
		straight	very weakly rounded	rounded		Bechyné, 1950a
		subparallel in basal ½				Warchałowski, 2003
pronotal punctures		fine and denser than in *herbacea*				Bechyné, 1950a
pronotum broadest	before base	basally				Bechyné, 1950a

Figure 40. Characters of the subspecies of *Ch. herbacea* after literature sources (ending).

character	*herbacea*	*recticollis*	*caucasica*	*alacris*	*talyshana*	reference
dorsal colora-tion		green	green with golden tint	greenish blue, with weak greenish tint		Motschulsky, 1860a
	green, golden green, olivaceous, coppery, greenish blue, purplish coppery, blue, violet, bronze, blackish				golden green, with coppery or blue tint	Bechyné, 1950a
apex of aedeagus	slightly constricted laterally	greatly constricted laterally			tapered, without constriction	Bechyné, 1950a
					tapered. without constriction	Warchałowski, 2003
area		Armenia, Asia Minor, Portugal	Mts. of Caucasus (Georgia)			Motschulsky, 1860a
	C, S Europe, Asia Minor, S European Russia	Azerbaijan, Ossetia	Caucasus	S Asia Minor (Taurus ridge)	S Azerbaijan (Talysh), N Iran (Elburs)	Bechyné, 1950a
	Europe to 55th parallel, C Asia	Caucasian countries	Caucasus	Asia Minor	N Iran	Warchałowski, 2003

A total score of 14 features were used in the literature for the identification of the subspecies considered valid. To study these characters, I measured five metric features: body length, body

width, maximal pronotal width, pronotal width at level of anterior angles, pronotal length along middle; and studied by the comparison with "reference" specimens nine qualitative features: size of elytral punctures (three characteristic states), shape of elytral lateral sides (two characteristic states), presence of elytral puncture rows (two characteristic states), shape of pronotal anterior angles (three characteristic states), shape of pronotal lateral sides in basal ½ (two characteristic states), size of pronotal punctures (three characteristic states), position of the pronotal maximal width (two characteristic states), elytral coloration (seven characteristic states), shape of aedeagus (four characteristic states). The "characteristic states" are mentioned below in the respective Figures 41-54.

Figure 41. Variability of body length.

region (nominal taxon)	number of specimens	body length (mm)		
		minimum	average	maximum
W Europe (*herbacea*)	40	7.1	8.9	10.7
Asia Minor (*alacris*)	115	6.5	8.4	10.3
Ukraine+Crimea	88	6.5	8.9	11.2
European Russia	18	7.4	8.2	9.1
Russian Caucasus	85	6.6	8.5	10.4
Georgia (*caucasica*)	46	7.3	8.8	10.3
Armenia (*recticollis*)	15	7.7	8.9	10.0
Azerbaijan (*talyshana*)	35	7.1	8.9	10.8
Turkmenistan, Iran	26	6.9	8.4	10.0
Syria	15	7.2	8.3	9.5

The length of the body showed no significant differences in the regions. From the literature (Motschulsky, 1860a; Bechyné, 1950a) it was known about a decrease in the body size of the Caucasian subspecies as follows: *talyshana*> *recticollis*> *caucasica*. The available material does not confirm this difference.

Figure 42. Ratio of body length of females and males.

region (nominal taxon)	number of ♀♀	number of ♂♂	min. - max. length ♀♀ (mm)	min. - max. length ♂♂ (mm)	average length ♀♀ (mm)	average length ♂♂ (mm)	ratio of average ♀♀ length / ♂♂ length
W Europe (*herbacea*)	19	21	7.7–10.7	7.1–8.8	9.4	8.0	1.17
Asia Minor (*alacris*)	59	56	7.7–10.3	6.5–9.0	9.3	7.9	1.17
Ukraine+Crimea	44	44	7.9–11.2	6.5–9.2	9.6	8.2	1.18
European Russia	7	11	7.4–9.1	7.4–7.9	8.5	7.6	1.13
Russian Caucasus	35	49	8.0–10.4	6.6–8.8	9.2	7.9	1.16
Georgia (*caucasica*)	28	18	7.9–10.3	7.3–9.1	9.2	7.9	1.17
Armenia (*recticollis*)	10	5	7.8–10.1	7.7–8.2	8.8	7.9	1.11
Azerbaijan (*talyshana*)	17	18	7.4–10.8	7.1–8.4	9,0	7,7	1,17
Turkmenistan, Iran	14	12	8.2–10.0	6.9–8.4	8.8	7.7	1.14
Syria	7	8	8.0–9.5	7.2–8.7	9.0	8.0	1.12

Result: in most regions, there is approximately the same difference in body length: females 1.16–1.18 X longer than males. Deviations are observed in regions where there were few specimens studied (Ukraine+Crimea, Georgia, Azerbaijan, Tukmenistan, Iran). This is probably due to the small sample size.

Figure 43. Puncturation at the disc of elytron.

region (nominal taxon)	number of specimens	proportion of individuals (%)		
		puncturation large (1)	puncturation moderate (2)	puncturation fine (3)
W Europe (*herbacea*)	40	3	22	75
Asia Minor (*alacris*)	115	2	20	78
Ukraine+Crimea	88	2	33	65
European Russia	18	6	33	61
Russian Caucasus	85	4	25	71
Georgia (*caucasica*)	46	2	20	78
Armenia (*recticollis*)	15		13	87
Azerbaijan (*talyshana*)	35		20	80
Turkmenistan, Iran	26		15	85
Syria	15			100

Result: geographical differences were not found.

Figure 44. Variability of elytral shape.

region (nominal taxon)	number of specimens	proportions of individuals with different elytral shape (%)	
		elytra evenly rounded laterally (1)	elytra parallel-sided at mid-length (2)
W Europe (*herbacea*)	40	93	7
Asia Minor (*alacris*)	115	98	2
Ukraine+Crimea	88	89	11
European Russia	18	100	
Russian Caucasus	85	81	19
Georgia (*caucasica*)	46	76	24
Armenia (*recticollis*)	15	100	
Azerbaijan (*talyshana*)	35	83	7
Turkmenistan, Iran	26	96	4
Syria	15	100	

Result: a relatively large proportion of the beetles with parallel lateral sides is observed in Georgia (this difference was noticed by Bechyné, 1950a) and the Russian Caucasus among all regions. However, this difference is significantly less than the subspecies rank. There must be at least 75% of the individuals that differ for the separate subspecies.

Figure 45. Variability in body shape.

region (nominal taxon)	number of specimens	ration: length / width		
		minimum	average	maximum
W Europe (*herbacea*)	40	1.5	1.7	1.9
Asia Minor (*alacris*)	115	1.5	1.7	1.9
Ukraine+Crimea	88	1.5	1.7	1.9
European Russia	18	1.6	1.7	1.8
Russian Caucasus	85	1.5	1.7	1.9
Georgia (*caucasica*)	46	1.6	1.7	1.9
Armenia (*recticollis*)	15	1.6	1.7	1.8
Azerbaijan (*talyshana*)	35	1.4	1.7	1.9
Turkmenistan, Iran	26	1.4	1.7	1.8
Syria	15	1.5	1.7	1.8

Result: difference is not observed.

Figure 46. Elytral puncture rows.

region (nominal taxon)	number of specimens	puncture rows (% specimens)	
		visible (1)	invisible (2)
W Europe (*herbacea*)	40	68	32
Asia Minor (*alacris*)	115	90	10
Ukraine+Crimea	88	86	14
European Russia	18	83	17
Russian Caucasus	85	88	12
Georgia (*caucasica*)	46	83	17
Armenia (*recticollis*)	15	93	7
Azerbaijan (*talyshana*)	35	91	9
Turkmenistan, Iran	26	73	27
Syria	15	100	

Result: beetles with distinct, well visible elytral puncture rows predominate in all regions. However, up to one-third of the beetles from W Europe, Turkmenistan and Iran have a completely irregular puncturation.

Figure 47. Variability of the shape of pronotum (ratio of maximum width and length along middle).

region (nominal taxon)	number of specimens	ration: width / length		
		minimum	average	maximum
W Europe (*herbacea*)	40	1.6	1.8	2.0
Asia Minor (*alacris*)	115	1.6	1.8	1.9
Ukraine+Crimea	88	1.6	1.8	1.9
European Russia	18	1.5	1.7	1.8
Russian Caucasus	85	1.6	1.7	2.0
Georgia (*caucasica*)	46	1.7	1.8	1.9
Armenia (*recticollis*)	15	1.7	1.8	2.0
Azerbaijan (*talyshana*)	35	1.7	1.8	1.9
Turkmenistan, Iran	26	1.7	1.8	2.0
Syria	15	1.6	1.7	1.9

Result: shape of pronotum practically does not differ in different regions.

Figure 48. Variability of the shape of pronotum (ratio of maximum width and width at level of anterior angles).

region (nominal taxon)	number of specimens	ratio: maximum width / width at level of anterior angles		
		minimum	average	maximum
W Europe (*herbacea*)	40	1.4	1.4	1.6
Asia Minor (*alacris*)	115	1.3	1.4	1.7
Ukraine+Crimea	88	1.3	1.4	1.6
European Russia	18	1.4	1.4	1.6
Russian Caucasus	85	1.3	1.4	1.6
Georgia (*caucasica*)	46	1.4	1.5	1.6
Armenia (*recticollis*)	15	1.4	1.5	1.6
Azerbaijan (*talyshana*)	35	1.4	1.5	1.6
Turkmenistan, Iran	26	1.4	1.5	1.7
Syria	15	1.4	1.4	1.5

Result: difference almost absents in different regions.

Figure 49. Variability of the shape of anterior angles of pronotum.

region (nominal taxon)	number of specimens	anterior angles, proportions of individuals (%)		
		slightly protruding (1)	moderately protruding (2)	strongly protruding (3)
W Europe (*herbacea*)	40	25	43	32
Asia Minor (*alacris*)	115	35	34	31
Ukraine+Crimea	88	13	43	44
European Russia	18	50	44	6
Russian Caucasus	85	45	40	15
Georgia (*caucasica*)	46	39	59	2
Armenia (*recticollis*)	15	33	40	27
Azerbaijan (*talyshana*)	35	40	49	11
Turkmenistan, Iran	26	12	23	65
Syria	15	33	34	33

Result: the specimens from European Russia and Georgia are the most different (with a small proportion of strongly protruding angles), but the differences are not sufficient for separation of the subspecies.

Figure 50. Shape of lateral sides of pronotum in basal ½.

region (nominal taxon)	number of specimens	lateral sides, proportions of individuals (%)	
		straight (1)	rounded (2)
W Europe (*herbacea*)	40	73	27
Asia Minor (*alacris*)	115	44	56
Ukraine+Crimea	88	52	48
European Russia	18	83	17
Russian Caucasus	85	47	53
Georgia (*caucasica*)	46	46	54
Armenia (*recticollis*)	15	67	33
Azerbaijan (*talyshana*)	35	60	40
Turkmenistan, Iran	26	31	69
Syria	15	53	47

Result: This is a variable feature on the specific area, not having a distinct clinal variability. The difference is insufficient to separate the subspecies.

Figure 51. Variability of puncture size at the centre of pronotal disc.

region (nominal taxon)	number of specimens	size of punctures, proportions of individuals (%)		
		large (1)	moderate (2)	fine (3)
W Europe (*herbacea*)	40	22	35	43
Asia Minor (*alacris*)	115	30	40	30
Ukraine+Crimea	88	17	27	56
European Russia	18	11	33	56
Russian Caucasus	85	2	31	67
Georgia (*caucasica*)	46	6	37	57
Armenia (*recticollis*)	15		67	33
Azerbaijan (*talyshana*)	35	3	57	40
Turkmenistan, Iran	26	3	8	89
Syria	15	7	40	53

Result. Variability is of a geographical nature. In Western Europe and Asia Minor, fine puncturation does not predominate over the remaining variants combined. Further to the east: in Ukraine, Crimea, European Russia, the Russian Caucasus, and Georgia slightly more than half of all individuals have fine puncturation. In Syria, the proportion is the same as in Georgia. However, the proportion is different in Azerbaijan and Armenia. The specimens with moderate punctures predominates there. The greatest predominance of small puncturation is in Turkmenistan and Iran. There are insufficient differences for identifying of geographical subspecies.

Figure 52. Position of the maximal width of pronotum.

region (nominal taxon)	number of specimens	position of maximal width, proportion of specimens (%)	
		on the pronotal base (1)	before the pronotal base (2)
W Europe (*herbacea*)	40	67	33
Asia Minor (*alacris*)	115	56	44
Ukraine+Crimea	88	60	40
European Russia	18	100	
Russian Caucasus	85	53	47
Georgia (*caucasica*)	46	61	39
Armenia (*recticollis*)	15	67	33
Azerbaijan (*talyshana*)	35	57	43
Turkmenistan, Iran	26	35	65
Syria	15	47	53

Result. Variability is of a geographical nature. Pronotum broadest basally slightly predominates in the most of specific range, it greatly predominates in European Russia. The reverse proportion is observed in the southeast of the range (Turkmenistan, Iran, Syria): pronotum broadest in front of the base slightly predominates there. There are insufficient differences for identifying of geographical subspecies.

Figure 53. Coloration of elytra.

region (nominal taxon)	number of specimens	coloration of elytra, proportions of specimens (%)						
		coppery (1)	copper gold (2)	golden green (3)	green (4)	bluish green (5)	blue (6)	violet (7)
W Europe (*herbacea*)	40		3	28	46	10	3	10
Asia Minor (*alacris*)	115		2	30	43	25		
Ukraine+Crimea	88	1	3	18	33	44	1	
European Russia	18		17	33	33	17		
Russian Caucasus	85		8	47	36	7	2	
Georgia (*caucasica*)	46			28	50	22		
Armenia (*recticollis*)	15			6	47	47		
Azerbaijan (*talyshana*)	35	2	9	29	54	6		
Turkmenistan, Iran	26			31	58	11		
Syria	15			7	53	33	7	

Comments

Result. The coloration of the elytra is variable, it covers the entire visible spectrum from red (copper) to violet. The colors of the middle part of the spectrum: from yellowish (golden) green to bluish green prevail in all regions. Differences of subspecific rank is not observed.

Figure 54. Variability in the shape of the apex of male aedeagus. A number of examined males differ from that in the Table 2 because aedeagus in some specimens was lost or destroyed before my study.

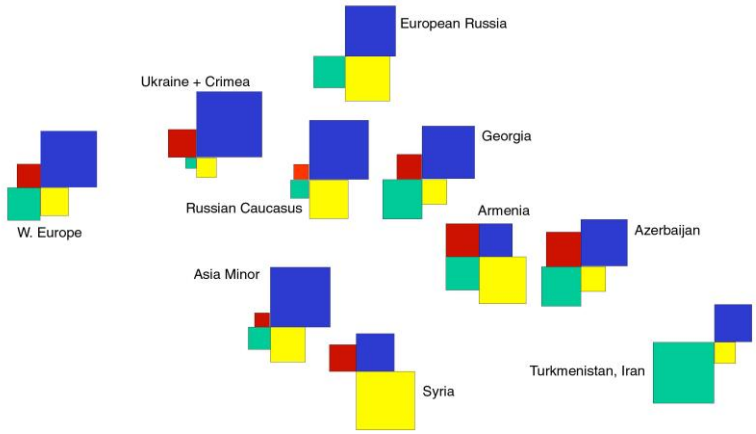
All states of this character can be represented as a field:

apex wide, without lateral emarginations (1)	apex moderately wide, with lateral emarginations (2)
apex narrow, without lateral emarginations (4)	apex narrow, with lateral emarginations (3)

region (nominal taxon)	number of specimens	shape of apex, proportions of specimens (%)			
		wide, without emargi-nations (1)	moderately wide, with emargi-nations (2)	narrow, with emargi-nations (3)	narrow, without emargi-nations (4)
W Europe (*herbacea*)	21	10	57	14	19
Asia Minor (*alacris*)	55	4	65	22	9
Ukraine+Crimea	43	14	77	7	2
European Russia	11		46	36	18
Russian Caucasus	48	4	63	27	6
Georgia (*caucasica*)	18	11	50	11	28
Armenia (*recticollis*)	5	20	20	40	20
Azerbaijan (*talyshana*)	18	22	39	11	28
Turkmenistan, Iran	12		25	8	67
Syria	8	12	26	62	

Result. Variability of the aedeagus was studied by Bechyné (1950a). According to his figures, the state 2 is typical for *herbacea* s.str., the state 3 – for *recticollis*, the state 4 – for *talyshana*. According to my data, state 2 prevails for most regions; state 3 prevails for Armenia and Syria. This is consistent with Bechyné (1950a), but only 40% of the males, examined by me, have this state. However, I had only five males from Armenia. Perhaps, this difference will be more noticeable on more abundant material, and then it will allow to confirm the subspecific rank of *recticollis*. The state 4 predominates (67 %) in Turkmenistan and Iran. So far, there are no grounds for distinguishing subspecies (any regional differences less than 75 %).

Figure 55. Color diagram of the aedeagus variability. Area of each square shows the ratio of the respective state of the shape of aedeagus apex : red – wide, without emarginations (1), violet – moderately wide, with emarginations (2), yellow – narrow, with emarginations (3), green – narrow, without emarginations (4).



260. After Kippenberg (2010), *Ch. coerulans* is regarded as a taxon to include seven valid subspecies (Fig. 56) as follows: nominotypical one with four available invalid synonyms, five subspecies without synonyms, and subspecies *uzbekorum* with synonym *iranica*. Kippenberg (2010) considered *Chrysomela subfastuosa* Motschulsky, 1860a to be a synonym of the subspecies *Ch. coerulans splendorifera*. In fact, *subfastuosa* is a synonym of *Ch. fastuosa*, as I established when studied a type of *subfastuosa* [see Comm. 176].

A review of the examined type and topotype specimens

1) *Chrysomela coerulans* Scriba, 1791 was described from Darmstadt city, Federal State of Hesse, S-W Germany, based on unrecognized number of specimens. I examined six specimens corresponding to the description of *coerulans* from different localities in Germany.

2) *Chrysomela oblonga* Duftschmid, 1825 was described from Linz city, N Austria, based on four specimens. The collection by C. Duftschmid is lost. I examined seven specimens from Austria which, on the one hand, correspond to the description of *oblonga* and, on the other hand, similar to *coerulans*.

3) *Chrysomela coerulans* var. *olivaceonigra* Fleischer, 1892 was described based on almost 100 syntypes from Bohemia (Czech Republic). Two males, syntypes, being at my disposal, are externally look like *coerulans*, with exception body black, dorsally with very weak olivaceous (greenish) tint, which more distinct on the head and pronotum. Aedeagus (I mounted one of these males) is identical to those in *coerulans*. Besides that, I studied 1 syntype (male) and 5 syntypes (females), and one additional specimen from Bohemia.

4) *Chrysolina coerulans relicta* L.Medvedev, 1977 was described based on single male, holotype from S Urals. I compared a holotype of *relicta* (*Synerga* figure 9) with available specimens of *Ch. coerulans*. I found the males from Turkey (Central Anatolia), Armenia and N-W Iran which, on the one hand, fall within the limits of variability of *coerulans coerulans*, and, on the other hand, identical with a holotype of *relicta*. They are almost entirely green, with puncturation on pronotum and elytra fine, with elytral punctures slightly weakened at apical slope, 6.3, 7.1, and

7.3 mm long. I identified them as *Ch. coerulans coerulans* ab. *evittata* Bechyné, 1950a. No one found *Ch. coerulans* in the Urals once more. The nearest location of *Ch. coerulans coerulans* is Chuvashia Republic, Tsivilsk city, 800 km to the west of the type locality of *relicta*. Thus, I believe the name *relicta* to be a synonym of *coerulans*, and a record of *Ch. coerulans* from Urals to be result of erroneous labeling.

5) *Chrysomela Angelica* Reiche et Saulcy, 1858 was described based on unrecognized number of specimens from Syria. I examined 14 specimens from Syria corresponding to the description of *angelica*.

6) *Chrysomela bella* Jacoby, 1890 was described based on unrecognized large number of specimens from Hubei Province, China. I examined two syntypes. They belong to the species *Ch. coerulans*. The type locality indicated by the author, Jacoby (1890), is doubtful, since, according to the examined materials and literature available to me, *Ch. coerulans* does not occur east of Tajikistan, Pakistan and Kashmir, was not recorded from China by Gressitt, Kimoto (1963). Yang, et al. (2015) erroneously cited "Pakistan" as a type locality of *bella* and recorded this taxon from N-E China. The last statement was not supported by any material.

7) *Chrysomela* (*Chrysolina*) *coerulans piffli* Lopatin, 1967 was described based on unrecognized number of specimens from Pakistan. I examined 38 syntypes, including males with mounted aedeagus (*Synerga* figure 10). This taxon was described briefly (Lopatin, 1967): "Liegt *Ch. coerulans uzbekorum* Bechyné sehr nahe, aber bei der neuen Unterart Scheibe der Flügeldecken schwach verloschen und Halsschild fein weitläufig punktiert. Aedeagus an der Spitze ausgeschweift".

8) *Chrysomela splendorifera* Motschulsky, 1860a was described based on unrecognized large number of specimens from Georgia, I examined a syntype, female.

9) *Chrysolina* (*Menthastriella*) *coerulans uzbekorum* Bechyné, 1950a was described based on unrecognized number of specimens from Samarkand city, Uzbekistan. I examined one syntype (male) (*Synerga* figure 11), one syntype (female), and six topotypes from Samarkand.

10) *Chrysomela coerulans iranica* Jakob, 1954 was described based on 198 syntypes from Iran. I examined four syntypes (2 males, 2 females) (*Synerga* figure 8**)**.

Figure 56 (the next page). Characters of subspecies of *Ch. coerulans*, known from the literature. The table does not contain data from publications on the range of subspecies, since their distribution is subject to my revision, based on the type localities of taxa.

characters	*coerulans*	*angelica*	*bella*	*piffli*	*splendorifera*	*uzbekorum*	*iranica*	References
size of punctures of elytra in lateral and hind part decreases ...	... scarcely	... strongly			... strongly	... strongly		Bechyné, 1950a
			... strongly (toward apex)					Jacoby, 1890
	not distinctly	distinctly			distinctly	distinctly		Warchalowski, 1993
	not distinctly					distinctly		Warchalowski, 2003, 2010
body length (mm)		6.5						Reiche, Saulcy, 1858
			6.4-10.2					Jacoby, 1890
			8					Maulik, 1926
	7-8.5	6-6.5			7-8.5	7-8.5		Bechyné, 1950a
	7-8.5						6-7	Jakob, 1954b
						7-8.5		Lopatin, 1977, 2010
elytral puncture rows		almost regular near suture						Jakob, 1954b
puncturation of pronotum and elytra			fine, sparse (pronotum)					Maulik, 1926
					fine	strong		Bechyné, 1950a
		denser and stronger than in coerulans (elytra)					on pronotum more dense and finer, on elytron more sparse and finer than in coerulans	Jakob, 1954b
				fine, sparse (pronotum)				Lopatin, 1967
					fine	coarse		Lopatin, 1977, 2010
		fine			fine	strong		Warchalowski, 1993
					fine	strong (on elytron)		Warchalowski, 2003, 2010
lateral sides of pronotum	evenly arc-shaped from the base						almost parallel in basal 2/3	Jakob, 1954b
shine and microreticulation of pronotum					pronotum entirely dull because of distict microreliculation	pronotum shining at least in basal 1/2		Bechyné, 1950a
					dull	shining at least near base		Lopatin, 1977, 2010
		shining			matt			Warchalowski, 1993, 2003, 2010
				slightly dull				Lopatin, 1967
lateral impression of pronotum		much broader than in coerulans, flattened						Jakob, 1954b
apex of aedeagus			slightly truncate and deeply emarginate at apex					Jacoby, 1890
	narrowly truncate, without emargination at apex							Bechyné, 1950a
	combined double apex	with two distict apical peaks					with double peak, shorter than in coerulans	Jakob, 1954b
				projecting				Lopatin, 1967
						with short, obtuse		Lopatin, 1977, 2010

Comments

A total score of 8 features were used in the literature for the identification of the subspecies of *Ch. coerulans* considered valid. To study these characters, I measured body length (from anterior margin of pronotum to apex of elytra), counted the number of puncture rows of elytra near suture (0, 1, 2 or 3 rows), and studied by the comparison with "reference" specimens seven qualitative features: shape of pronotal lateral sides in basal ½ (2 states), presence of lateral impressions at pronotal base (2 states), size of punctures on pronotal disc (3 states), presence of microreticulation on pronotum (2 states), size of elytral punctures (2 states), decreasing of the size of elytral punctures from the middle to the sides (2 states), shape of aedeagus (4 states, see figure in Review of subgenera, subgenus *Synerga*). In addition to the above characteristics, I analyze the coloration of elytra described in some works. I distinguish 11 variants of coloration (Fig. 57).

Analysis of the geographic variability of *Ch. coerulans* and the taxonomic rank of intraspecific taxa:

Figure 57. Coloration of elytra in *Ch. coerulans.*

bright metallic	series of colors "across the spectrum"	1 – purple with golden longitudinal stripes: broad discal and narrow sutural – ab. *mimeomicans* Bechyné (?)	2 – red with golden green longitudinal stripes: broad discal and narrow sutural – ab. *evittata* Bechyné (?)	3 – red with bluish green longitudinal stripes (margined with golden): broad discal and narrow sutural	4 – golden red with violet longitudinal stripes (margined with green): broad discal and narrow sutural – ab. *adameki* Bechyné	5 – green with violet longitudinal stripes: broad discal and narrow sutural – ab. *starhorni* Reitter	6 – bluish-green with bluish violet longitudinal strips: broad discal and narrow sutural	7 – blue with indistinct violet longitudinal stripes: broad discal and narrow sutural	8 – entirely violet – *coerulans*
	additional				4A- green with golden tint at inner ½	5A – green with blue suture			
dark metallic	9 – dark olivaceous- ab. *olivaceonigra* Fleischer								

Figure 58. Body length from anterior margin of pronotum to elytral apex.

region (*nominal taxon* described from this region)	number of specimens (♂, ♀)	body length (mm)		
		minimum – maximum (average), both sexes	minimum – maximum (average), ♂	minimum – maximum (average), ♀
Central Europe (***coerulans***)	38 (22, 16)	5.9–8.8 (7.4)	5.9–7.6 (7.1)	6.6–8.8 (7.9)
Bulgaria + Balkans + Turkey	17 (7, 10)	6.1–8.5 (7.4)	6.1–7.5 (7.0)	7.0–8.5 (7.6)
Egypt + Syria (***angelica***) + Israel + Palestine	23 (14, 9)	5.3–7.7 (6.6)	5.3–7.3 (6.3)	6.3–7.7 (7.1)
Transcaucasia (***splendorifera***)	34 (12, 22)	5.9–9.0 (7.4)	5.9–7.4 (6.7)	7.2–9.0 (7.8)
Iran (***iranica***) + Iraq	35 (10, 25)	6.3–8.7 (7.6)	6.3–7.4 (6.9)	6.9–8.7 (7.9)
Turkmenistan	13 (6, 7)	6.8–8.3 (7.5)	6.8–7.5 (7.1)	7.4–8.3 (7.8)
Tajikistan + Uzbekistan (***uzbekorum***)	36 (12, 24)	6.3–9.2 (7.8)	6.3–7.7 (7.2)	7.0–9.2 (8.2)
Afghanistan + Pakistan (***piffli***)	42 (23, 19)	6.2–8.5 (7.2)	6.2–7.4 (6.8)	7.4–8.5 (7.8)
Kashmir	20 (10, 10)	6.3–8.0 (7.2)	7.3–8.0 (7.7)	6.3–7.2 (6.7)

Results. In the literature, there is a significant difference of *angelica* and *iranica* from other subspecies in body size, as follows: specimens of these two taxa are smaller than others, without overlapping the limits of variability with the other subspecies. According to available data, specimens from Egypt, Syria, Israel, and Palestine are smaller than those from other regions. However, overlapping the limits of variability is significant. Specimens from Iran are similar with those from other regions in body length.

Figure 59. Shape of pronotal lateral sides in basal ½.

region (*nominal taxon* described from this region)	number of specimens	sides rounded	sides straight
		number of specimens (%)	number of specimens (%)
Central Europe (*coerulans*)	38	16 (42 %)	22 (58 %)
Bulgaria + Balkans + Turkey	17	9 (53 %)	8 (47 %)
Egypt + Syria (*angelica*) + Israel + Palestine	23	10 (43 %)	13 (57 %)
Transcaucasia (*splendorifera*)	34	9 (26 %)	25 (74 %)
Iran (*iranica*) + Iraq	35	15 (43 %)	20 (57 %)
Turkmenistan	13	7 (54 %)	6 (46 %)
Tajikistan + Uzbekistan (*uzbekorum*)	36	21 (58 %)	15 (42 %)
Afghanistan + Pakistan (*piffli*)	42	28 (67 %)	14 (33 %)
Kashmir	20	15 (75 %)	5 (25 %)

Results. Specimens from Uzbekistan, Tajikistan, Afghanistan, Pakistan and Kashmir differ significantly from specimens from other regions: lateral sides of pronotum are rounded in more than 50% specimens. Moreover, this character increases in the direction from the north-west to the south-east, but even in Kashmir the difference does not reach the subspecific level.

Figure 60. Lateral impression at pronotal base.

region (*nominal taxon* described from this region)	total number of specimens	impression absent, number of specimens (%)	impression present, number of specimens (%)
Central Europe (*coerulans*)	38	15 (39 %)	23 (61 %)
Bulgaria + Balkans + Turkey	17	9 (53 %)	8 (47 %)
Egypt + Syria (*angelica*) + Israel + Palestine	23	16 (70 %)	7 (30 %)
Transcaucasia (*splendorifera*)	34	26 (76 %)	8 (24 %)
Iran (*iranica*) + Iraq	35	29 (83 %)	6 (17 %)
Turkmenistan	13	8 (62 %)	5 (38 %)
Tajikistan + Uzbekistan (*uzbekorum*)	36	34 (94 %)	2 (6 %)
Afghanistan + Pakistan (*piffli*)	42	28 (67 %)	14 (33 %)
Kashmir	20	15 (75 %)	5 (25 %)

Results. Pronotal lateral impressions present in the most specimens from Central Europe. This character distinguishes them from specimens from other regions, however the difference does not reach the subspecific level.

Figure 61. Size of punctures at pronotal disc.

region (*nominal taxon* described from this region)	total number of specimens	pronotal punctures		
		fine, number of specimens (%)	moderate, number of specimens (%)	large, number of specimens (%)
Central Europe (*coerulans*)	38	27 (71 %)	11 (29 %)	0
Bulgaria + Balkans + Turkey	17	10 (59 %)	6 (35 %)	1 (6 %)
Egypt + Syria (*angelica*) + Israel + Palestine	23	20 (87 %)	2 (9 %)	1 (4 %)
Transcaucasia (*splendorifera*)	34	31 (91 %)	3 (9 %)	0
Iran (*iranica*) + Iraq	35	21 (60 %)	14 (40 %)	0
Turkmenistan	13	13 (100 %)	0	0
Tajikistan + Uzbekistan (*uzbekorum*)	36	7 (19 %)	20 (56 %)	9 (25 %)
Afghanistan + Pakistan (*piffli*)	42	27 (64 %)	11 (26 %)	4 (10 %)
Kashmir	20	19 (95 %)	1 (5 %)	0

Results. Specimens from Tajikistan and Uzbekistan differ from others, however the difference does not reach the subspecific level.

Figure 62. Microreticulation of pronotal disc.

region (*nominal taxon* described from this region)	total number of specimens	pronotal disc	
		dull, with distinct reticulation, number of specimens (%)	shining, without distinct reticulation, number of specimens (%)
Central Europe (*coerulans*)	38	35 (92 %)	3 (8 %)
Bulgaria + Balkans + Turkey	17	17 (100 %)	-
Egypt + Syria (*angelica*) + Israel + Palestine	23	11 (48 %)	12 (52 %)
Transcaucasia (*splendorifera*)	34	25 (74 %)	9 (26 %)
Iran (*iranica*) + Iraq	35	18 (51 %)	17 (49 %)
Turkmenistan	13	7 (54 %)	6 (46 %)
Tajikistan + Uzbekistan (*uzbekorum*)	36	32 (89 %)	4 (11 %)
Afghanistan + Pakistan (*piffli*)	42	25 (60 %)	17 (40 %)
Kashmir	20	18 (90 %)	2 (10 %)

Results. Bechyné (1950a) and Lopatin (1977, 2010) believed this character to be diagnostic for the separation of the subspecies *splendorifera* (occurring in Turkmenistan, Transcaucasia, Iran, and Iraq, after Lopatin, 1977, 2010) and *uzbekorum* (occurring in Uzbekistan, Tajikistan, Kyrgyzstan, and N Afghanistan, after Lopatin, 1977, 2010). However, I did not observe this difference between the specimens from that regions. In general, this character does not give a subspecific difference anywhere.

Figure 63. Presence of distinct puncture rows near elytral suture.

region (*nominal taxon* described from this region)	total number of specimens	puncture rows near elytral suture, number of specimens (%)			
		rows absent	1 row present	2 rows present	3 rows present
Central Europe (*coerulans*)	38	5 (13 %)	10 (27 %)	5 (13 %)	18 (47 %)
Bulgaria + Balkans + Turkey	17	1 (6 %)	6 (35 %)	3 (18 %)	7 (41 %)
Egypt + Syria (*angelica*) + Israel + Palestine	23	3 (13 %)	15 (65 %)	3 (13 %)	2 (9 %)
Transcaucasia (*splendorifera*)	34	5 (15 %)	11 (32 %)	6 (18 %)	12 (35 %)
Iran (*iranica*) + Iraq	35	5 (14 %)	16 (46 %)	8 (23 %)	6 (17 %)
Turkmenistan	13	-	-	1 (8 %)	12 (92 %)
Tajikistan + Uzbekistan (*uzbekorum*)	36	2 (6 %)	7 (19 %)	4 (11 %)	23 (64 %)
Afghanistan + Pakistan (*piffli*)	42	2 (5 %)	6 (14 %)	7 (17 %)	27 (64 %)
Kashmir	20	1 (5 %)	1 (5 %)	1 (5 %)	17 (85 %)

Result. This character is variable. It distinguishes certain regions, e.g. (Egypt + Syria + Israel + Palestine) from Turkmenistan and Kashmir. In general, there is not sufficient data to observe subspecific differences.

Figure 64. Size of punctures at elytral disc.

region (*nominal taxon* described from this region)	total number of specimens	elytral punctures, number of specimens (%)	
		fine	large
Central Europe (*coerulans*)	38	32 (84 %)	6 (16 %)
Bulgaria + Balkans + Turkey	17	15 (88 %)	2 (12 %)
Egypt + Syria (*angelica*) + Israel + Palestine	23	21 (91 %)	2 (9 %)
Transcaucasia (*splendorifera*)	34	18 (53 %)	16 (47 %)
Iran (*iranica*) + Iraq	35	31 (89 %)	4 (11 %)
Turkmenistan	13	11 (85 %)	2 (15 %)
Tajikistan + Uzbekistan (*uzbekorum*)	36	21 (58 %)	15 (42 %)
Afghanistan + Pakistan (*piffli*)	42	24 (57 %)	18 (43 %)
Kashmir	20	15 (75 %)	5 (25 %)

Result. Small elytral puncturation predominates to a greater or lesser extent in all regions. There are no subspecific differences.

Figure 65. Decreasing of the size of elytral punctures from the middle to the sides.

region (*nominal taxon* described from this region)	total number of specimens	size of elytral punctures from the middle to the sides, number of specimens (%)	
		decreasing	not decreasing
Central Europe (*coerulans*)	38	10 (26 %)	28 (74 %)
Bulgaria + Balkans + Turkey	17	5 (29 %)	12 (71 %)
Egypt + Syria (*angelica*) + Israel + Palestine	23	5 (22 %)	18 (78 %)
Transcaucasia (*splendorifera*)	34	14 (41 %)	20 (59 %)
Iran (*iranica*) + Iraq	35	8 (23 %)	27 (77 %)
Turkmenistan	13	5 (38 %)	8 (62 %)
Tajikistan + Uzbekistan (*uzbekorum*)	36	11 (31 %)	25 (69 %)
Afghanistan + Pakistan (*piffli*)	42	5 (12 %)	37 (88 %)
Kashmir	20	2 (10 %)	18 (90 %)

Result. This character is difficult to observe. An inaccuracy in the evaluation of the state of the character is possible. No subspecific differences found.

Comments

Figure 66. Coloration of elytra.

region (*nominal taxon* described from this region)	total number of specimens	1 – purple with golden longitudinal stripes: broad discal and narrow sutural	2 – red with golden green longitudinal stripes: broad discal and narrow sutural	3 – red with bluish green longitudinal stripes (margined with golden): broad discal and narrow sutural	4 – golden red with violet longitudinal stripes (margined with green): broad discal and narrow sutural	4A- green with golden tint at inner ½	5 – green with violet longitudinal stripes: broad discal and narrow sutural – ab. *starhorni* Reitter	5A – green with blue suture	6 – bluish green with bluish violet longitudinal strips: broad discal and narrow sutural	7 – blue with indistinct violet longitudinal stripes: broad discal and narrow sutural	8 – entirely violet – *coerulans*	9 – dark olivaceous- ab. *olivaceonigra* Fleischer
Central Europe (*coerulans*)	38	-	-	-	-	-	2 (5%)	1 (3%)	9 (24%)	16 (42%)	5 (13%)	5 (13%)
Bulgaria + Balkans + Turkey	17	-	-	-	4 (23%)	-	3 (18%)	2 (12%)	5 (29%)	2 (12%)	1 (6%)	-
Egypt + Syria (*angelica*) + Israel + Palestine	23	-	2 (9%)	8 (35%)	12 (52%)	-	-	-	-	-	1 (4%)	-
Transcaucasia (*splendorifera*)	34	1 (2%)	2 (6%)	12 (35%)	3 (9%)	8 (24%)	4 (12%)	2 (6%)	2 (6%)	-	-	-
Iran (*iranica*) + Iraq	35	1 (3%)	-	13 (37%)	10 (29%)	4 (11%)	4 (11%)	2 (6%)	-	-	-	1 (3%)
Turkmenistan	13	-	-	1 (8%)	7 (54%)	1 (8%)	4 (30%)	-	-	-	-	-
Tajikistan + Uzbekistan (*uzbekorum*)	36	1 (3%)	-	4 (11%)	18 (50%)	7 (19%)	6 (17%)	-	-	-	-	-
Afghanistan + Pakistan (*piffli*)	42	-	-	1 (2%)	10 (24%)	6 (14%)	22 (52%)	-	2 (6%)	1 (2%)	-	-
Kashmir	20	-	-	2 (10%)	8 (40%)	-	10 (50%)	-	-	-	-	-

Result. Specimens from C Europe (states 6, 7, 8 predominate) are well different from the others (3, 4, 4A, 5 predominate) except Bulgaria+Balkans+Turkey (4, 5, 6 predominate). This fits into the definition of geographical subspecies. Bulgaria+Balkans+Turkey is a border region between above named regions with a subspecific level of difference in coloration. State 9, dark, dull, unlike the others bright metallic, prevails, probably in the Czech Republic (described as *olivaceonigra*), but found also in Iran (one specimen).

Figure 67. Shape of the apex of aedeagus (see figures 4–11 in Review of subgenera, subgenus *Synerga*).

region (*nominal taxon* described from this region)	total number of specimens,	shape of the apex of aedeagus, number of specimens (%)			
		wide, without lateral emarginations (1)	moderately wide, with lateral emarginations (2)	apex narrow, with lateral emarginations (3)	apex narrow, without lateral emarginations (4)
Central Europe (*coerulans*)	22	5 (23 %)	17 (77 %)	-	-
Bulgaria + Balkans + Turkey	7	1 (14 %)	6 (86 %)	-	-
Egypt + Syria (*angelica*) + Israel + Palestine	14	2 (14 %)	12 (86 %)	-	-
Transcaucasia (*splendorifera*)	12	5 (42 %)	7 (58 %)	-	-
Iran (*iranica*) + Iraq	10	5 (50 %)	5 (50 %)	-	-
Turkmenistan	6	2 (33 %)	4 (67 %)	-	-
Tajikistan + Uzbekistan (*uzbekorum*)	12	-	1 (9 %)	4 (33 %)	7 (58 %)
Afghanistan + Pakistan (*piffli*)	23	-	1 (5 %)	15 (65 %)	7 (30 %)
Kashmir	10	-	-	6 (60 %)	4 (40 %)

Result. There is a difference of the subspecific level between the regions:1) Tajikistan + Uzbekistan + Afghanistan + Pakistan + Kashmir and 2) other regions. Moreover, it is a subspecific, and not a specific difference, since a small number of males from Tajikistan, Uzbekistan, and Afghanistan has aedeagus of the state "2" which is typical of the other regions.

Conclusions. I separate three subspecies:

1) distributed in Central Europe, with prevailing color states 6–7–8, aedeagus states 1 or 2. Region: Bulgaria+Balkans+Turkey is a border between this subspecies and the next one.

2) distributed in Egypt, Syria, Israel, Palestine, Transcaucasia, Iran, Iraq, and Turkmenistan, with prevailing color states 3–4–4A–5, aedeagus states 1 or 2.

3) distributed in Uzbekistan, Tajikistan, Afghanistan, Pakistan, Kashmir, with prevailing color states 3–4–4A–5 (as in subspecies 2), but aedeagus different: significantly prevailing states 3 and 4.

The difference in the specimens from Syria (described as *angelica*), Transcaucasia (described as *splendorifera*), Iran (described as *iranica*) does not give the subspecific level by any of the characters studied.

Two syntypes of the taxon *bella* are characteristic of color state 4. I had not a possibility to examine an aedeagus. According to the original description, aedeagus is state 3 or 4. I treat *bella* as a subspecies "3)".

Thus, valid names (senior synonyms) for the subspecies of *Ch. coerulans* are as follows: 1) *coerulans*, 2) *angelica*, 3) *bella* (type locality of *bella* is probably incorrect in the original description and type labels, see above).

Besides that, I studied 2 females from Cyprus, color state 1, subspecies *angelica*. One female from Kazakhstan (color state 4a) and one female from Kyrgyzstan (color state 4) can not be attributed with any subspecies. Finally, three males and 4 females from the Altai Territory (Semenovskoye vill.) belong to subspecies *angelica*. However, the record of *Ch. coerulans* from Altai should be confirmed. This is far from the known boundaries of the range. *Ch. coerulans* is not known from Siberia (Medvedev, Dubeshko, 1992; Lopatin, 2010).

The generic name *Synerga* was proposed by Weise (1900) with the type species *Chrysomela bella* by monotypy. The author noted a feature that distinguishes *Synerga* from *Chrysomela* (= *Chrysolina*), namely elytral epipleura glabrous. Besides that, the author indicated a number of differences in the structure of maxillary palpi, meso- and metasternum, absence of posterior setiferous pore on pronotum, and considered *Synerga* as a genus close to *Oreina*.

Jacoby (1890) described *Chrysomela bella* 10 years before the publication of the description of *Synerga* by Weise (1900) and knew about the above opinion of J. Weise. Therefore, Jacoby (1890) noted: "After Weise, this species <...> is a member of a new genus, close to *Melasoma*; however, in my opinion, the differences of this species are insufficient to separate it from *Chrysomela*".

Maulik (1926) could not recognize the beetles corresponding to the description of *Synerga* in the fauna of India. He did not use this generic name, however, recorded *Ch. bella* from N-W Himalayas compared with the type of the latter.

I examined two syntypes of *Ch. bella* and came to conclusion that this taxon corresponds to all the characters of the genus *Chrysolina*, including the presence of setae on elytral epipleura. I believe, the type species of *Synerga* was erroneously identified by Weise (1900). On the other hand, the name *Synerga* is in the prevailing usage as a valid name of the subgenus of the genus *Chrysolina*, e.g. by Seeno, Wilcox (1982), Burakowski, Mroczkowski, Stefańska (1990), Daccordi (1994), Bieńkowski (2001), Warchałowski (2003), Kippenberg (2010), Yang (2014). Therefore I designate nominal taxon *bella* Jacoby, nec Weise as a type species of *Synerga* according to (ICZN, 1999, 70.3.1).

261. *Ch. imperfecta* was originally described based on four males "aus Persien (Ala-Dagh, Budschnurd)" [= Reshten-ye Ala Dagh, Bojnurd, Khorasan-e Shomali, Iran] and one female "aus

der Umgebung von Kuschke (Afghanistan)" [=Serhetabat = Kushka, Turkmenistan]. Subsequently Bechyné (1952a) designated a lectotype from Ala-Dagh.

It was previously considered that *imperfecta* inhabits Turkmenistan, Iran, and N Afghanistan (Lopatin, 1977). Later, it was recorded from the Caucasus (Chechnya, Georgia, Azerbaijan) and S-E of European Russia ("Sarepta") (Bieńkowski, 1999b). Now I have at my disposal the specimens from E Turkey.

Bourdonné (2005) examined type specimens of *Ch. lurida bakuensis* and considered that *bakuensis* is a subspecies of *Ch. imperfecta*, which inhabits Azerbaijan, Georgia, and Armenia. I also examined one syntype of *Ch. lurida bakuensis* (*Taeniosticha* figure 51).

To study the taxonomical position of subspecies *imperfecta* s.str. and *imperfecta bakuensis*, I examined the following characters, according to which available specimens possess variability (Fig. 68):

1) body length,

2) ratio: maximum width of pronotum / length of pronotum along mid-length,

3) shape of pronotum in basal ½, two states: (1) with lateral sides almost parallel, slightly rounded, (2) with lateral sides distinctly convergent forward,

4) punctures at pronotal disc, two states: (1) well visible at magnification 10 X, (2) invisible at magnification 10 X,

5) puncturation in elytral intervals, two states: (1) well visible at magnification 10 X, (2) invisible or almost so at magnification 10 X,

6) coloration of elytra, two states: (1) brown, margined with rufous basally and laterally, (2) entirely rufous,

7) length of hind wings, three states: (1) strongly reduced, not reaching elytral apex, (2) moderately reduced, reaching elytral apex, (3) normally developed, broad, longer than elytron.

Other characters.

Bourdonné (2005, p. 327) gives figures showing the difference in the subspecies by the shape of aedeagus as follows: *imperfecta* s.str. – apex is broadly rounded, lobe of apical orifice is short; and subsp. *bakuensis* – apex is narrowly protruding, lobe of apical orifice is longer than in the former. Males being at my disposal (29 from the Caucasus, 6 from Central Asia, 5 from Iran) do not have such variability. All of them have aedeagus almost as that pictured by Bourdonné (2005) for *bakuensis*.

Bourdonné (2008) investigated a number of features of *imperfecta* s.str. (based on 17 males, 16 females) and subsp. *bakuensis* (based on 20 males, 11 females) as follows: relative length of hind wings, length of spermatheca, relative width of 3rd fore-tarsomere in male, relative length of antenna in male and female, shape of the last maxillary palpomere, relative width of pronotum in male and female, greatest width of elytron relative to width of pronotum in male and female, relative length of aedeagus. A significant difference was found only in the length of hind wings: as long as 0.8–1.6 X elytral length in *imperfecta* s.str., 1.6–1.8 X – in subsp. *bakuensis*, without regard to sex (Bourdonné, 2008).

Comments

region	number of specim., ♂♀	length male min.-max. (average)	length female min.-max. (aver.)	pronotum width / length min. – max. (average)	shape of pronotum %		pronotal punctures (magnification 10 X) %		elytral punctures (magnification 10 X) %		elytral coloration %		length of hind wings %		
					1	2	well visible	invisible	well visible	invisible	brown margined with rufous	rufous	shorter than elytron	as long as elytron	normally developed
Turkey	1, 4	6.3	6.2–7.3 (6.5)	2.0–2.1 (2.1)	20	80	40	60	100	0	0	100	0	20	80
Georgia	11, 14	5.7–6.4 (6.1)	6.1–7.1 (6.5)	2.0–2.3 (2.1)	40	60	36	64	92	8	8	92	8	48	44
Armenia	7, 3	5.6–6.6 (6.1)	6.3–6.8 (6.6)	2.0–2.2 (2.1)	50	50	50	50	100	0	0	100	50	40	10
Azerbai-jan.	14, 20	5.5–6.4 (5.9)	5.9–7.0 (6.6)	1.9–2.3 (2.1)	41	59	44	56	91	9	3	97	18	58	24
all Caucasus	36, 47	5.5–6.6 (6.0)	5.9–7.1 (6.5)	1.9–2.3 (2.1)	39	61	41	59	93	7	4	96	16	54	30
Turkme-nistan + Uzbeki-stan.	17, 24	5.8–7.0 (6.5)	6.4–7.6 (7.0)	2.0–2.4 (2.1)	78	22	20	80	44	56	39	61	7	22	71
Iran	5, 12	5.5–6.6 (6.1)	6.1–7.5 (6.9)	2.0–2.3 (2.1)	71	29	17	83	35	65	24	76	0	81	19

Figure 68. Variability of the characters in *Ch. imperfecta*. Legend: shape of pronotum: 1 – lateral sides almost parallel in basal ½, 2 – lateral sides convergent forward.

As a result, I found the differences as follows:

1) Shape of pronotum: state 2 insignificantly prevails in the Caucasus, while state 1 strongly prevails in Central Asia and Iran. Difference of the specimens from the Caucasus and Central Asia is not reaching subspecific level (75%). A subspecific difference is observed only between the specimens from Central Asia and Turkey, that is, the opposite ends of the specific range. This is more likely to be clinal variability than subspecific one.

2) Puncturation of pronotal disc some differs in the specimens from Central Asia + Iran and the Caucasus + Turkey. Difference is not reaching subspecific level.

3) Puncturation of elytral intervals some differs in the specimens from Central Asia + Iran and the Caucasus + Turkey. Difference is more significant than by the pronotal puncturation, however not reaching subspecific level.

4) Rufous color of elytra prevails greatly in the Caucasus and Turkey, less distinctly in Central Asia (39% specimens has brown elytra margined by rufous). Specimens from Iran occupy an intermediate position by this character. Difference between the specimens from the Caucasus and Central Asia does not reach the subspecific level; and in view of Iran, it may be noted a clinal variability.

5) Specimens from different regions vary considerably in the degree of reduction of hind wings. Specimens with normally developed wings prevail in Turkey and Central Asia, those with reduced wings – in Iran and Transcaucasia (except Georgia). Specimens from Georgia occupy intermediate position by this character. Such a mosaic distribution does not fit into the concept of geographical subspecies.

Thus, we can state geographic variability in the shape of pronotum, puncturation of the pronotal disc and elytral intervals, elytral color, and degree of reduction of hind wings. But the difference between the Central Asian-Iranian subspecies *imperfecta* s.str. and Transcaucasian subspecies *bakuensis* is not confirmed.

A female from the type series of *Ch. imperfecta*, paralectotype ("Kuschke (Afghanistan)" was isolated in a separate subspecies *plusquamperfecta* by Bechyné (1952a).

The initial distinguishing features of the subspecies *plusquamperfecta* were the following: pronotal lateral callus entirely developed, body larger than in the nominotypical subspecies, about 7 mm, and elytral puncturation stronger (Bechyné, 1952a). Bourdonné (2005) investigated this female, holotype of *plusquamperfecta*, and found the differences from the nominotypical subspecies only in body length (8.2 mm) and shape of spermatheca (the horn of the spermatheca is strongly arcuate, of a small cross section, while *imperfecta* has short, slightly arcuate horn, of a large cross section). Bourdonné (2005) noted, that the following original characters of *plusquamperfecta* as pronotal lateral callus developed in anterior part and larger elytra puncturation are not confirmed by the examination of the type specimen. Bourdonné (2005) considered *plusquamperfecta* to be a separate species.

Specimens of *imperfecta* being at my disposal are really smaller than the type of *plusquamperfecta*, 6.1–7.5 mm long. The difference of the shape of spermatheca in *imperfecta imperfecta*, *imperfecta bakuensis*, and *plusquamperfecta* in Bourdonné (2008) was based on the examination of 6, 4, and 1 female, respectively. I studied spermathecae of 8 females from Azerbaijan (area of *bakuensis*) and 7 females from Turkmenistan (area of *imperfecta*). I found the shape of spermatheca to be variable, however, a geographic difference between specimens from Azerbaijan and Turkmenistan was not observed (*Taeniosticha* figures 17–31). I could not find any specimen similar to the type of *plusquamperfecta* by the spermatheca structure in my materials. I have males and females of *imperfecta* on either side of the type locality of *plusquamperfecta*, from

Turkmenistan and Iran. No other species of this species group have been found in that region by any one.

I think it is impractical to isolate a subspecies or species based on one female, differing only by large size of the body and spermatheca structure. The only specimen can be aberrant. The variability of the spermatheca in the genus *Chrysolina* is not well studied. I also believe that the shape of the spermatheca can serve to confirm the identification of the *Chrysolina* females, determined by other characters, but not the basis for distinguishing a separate species. The shape of the spermatheca can be species-specific in the genus *Chrysolina* (Bieńkowski, 1998), but it can be very variable within the species of different leaf beetles (Moseyko, 2017).

Later I examined a holotype (female) of *plusquamperfecta* and found pronotal lateral impression in anterior ½ weak, slightly more deep than it is typical for *imperfecta*. I could not find other differences from *imperfecta*. Spermatheca of the holotype *plusquamperfecta* is more or less corresponds to the respective figure by Bourdonné (2008), however, it is deformed in the slide, its shape is artifact and does not correspond to the real shape.

262. Distinctive features (Bourdonné, 2005) of *kungeyana*, such as a puncturation of the pronotal disc small, not visible or barely visible at 10 X (unlike rather strong, distinct at 10 X puncturation in *tianshanica*), and moderately developed lateral denticles at the apex of aedeagus (unlike the obsolete denticles in *tianshanica*) (Bourdonné, 2005) are variable in the material (9 males (including 2 paratypes of *kungeyana*), 5 females) studied by me. In the paratypes examined, puncturation of the pronotal disc is small, but distinct, lateral denticles at the apex of aedeagus are flattened, not visible from above (*Taeniosticha* figure 56). This allows me to consider *kungeyana* to be a synonym of *tianshanica*. This assumption was already expressed by Romantsov (2008).

263. According to the original description, the type series of *alatavica* includes two males and four females. I found three type specimens, females (ZIN). There are three more specimens collected by Ryuckbeyl in ZIN, labeled by Jacobson as "type", but collected in 1910, while the original description is based on the collections of 1906 and 1909. Three latter specimens are not the types.

264. A holotype of *Ch. kiritshenkoi* was designated in the original publication. Series of this species in the I.K. Lopatin collection bears the geographical labels identical to that in the original description and identification labels "*Ch. kiritshenkoi*" by the author, but without any labels "holotype" and "paratype". The rest of this series (most specimens) is deposited in ZIN without any Lopatin's identification labels. I found in DEI and ZSM several specimens of *Ch. kiritshenkoi* labeled as "paratypes". Thus, it should be recognized the holotype as lost. The recent interpretation of the taxon in question is clear (Lopatin, 1970b, 1977, 2010). But if, for some reason, it needs to be clarified, it should be designated a neotype.

265. A holotype of *Ch. mohri* was designated in the original publication (Lopatin, 1970b). However, all type specimens are supplied with the labels "syntype" (ZIN). Thus, the holotype can not be recognized. Type specimen in DEI is labeled as "paratype". Type locality is indicated on the original type labels as follows: "Ala-Tau Matthiessen". This is rather uncertain record. This may be Dzhungar Alatau, Tallas Alatau, Kungei Alatau or Trans-Ili Alatau (the latter most likely, since L. Matthiessen collected there during 3 or 4 seasons), excluded Terskey Ala-Too, Kyrgyz Alatau, Kuznetsky Alatau (D.A. Milko personal communication). A series of this species was collected by M.L. Danilevsky in Kyrgyzstan, Issyk-Kul reg., Cholpon-Ata city, 3000 m above sea level.

266. I found in ZIN one male with the geographic label identical to that of the syntype of *Ch. sajanica* and without any identification labels. This male is conspecific with *Ch. lopatini*. However, there is no reason to change the interpretation of the name *sajanica* sensu Voronova, 1985 since, according to the original description, the species *sajanica* was described by two females. Thus, a male is not a type specimen.

267. The following features were treated to study an intraspecific variability of *Ch. pseudolurida*. This list of characters includes everything used by Bechyné (1952a) in the key of subspecies of *Ch. pseudolurida*, in the descriptions of new subspecies, as well as the distinguishing features of *Ch. samarensis*: body shape (ratio: length / width), dimorphism in body size (ratio: average length of female / average length of male), proportions of pronotum (ratio: width / length), shape of pronotum, puncturation on pronotal disc, microreticulation of pronotal disc, presence of lateral impression in anterior ⅔ of pronotum, shining of elytron, coloration of elytral disc, coloration of elytral suture, size of punctures in elytral rows, puncturation of elytral intervals, shape of hind wings, width of 1st fore-tarsomere in male, proportions of aedeagus (ratio: length / width), shape of apex of aedeagus.
The following characters were examined in each specimen (Fig. 69):

1) body length,
2) width of elytron in the horizontal plane,
3) greatest width of pronotum
4) length of pronotum along the midline between the anterior and basal margins,
5) width of 1st fore-tarsomere in male,
6) length of aedeagus
7) width of aedeagus at the level of apical orifice
8) shape of pronotal lateral sides in anterior ⅔ (3 states: (1) convergent toward base, (2) parallel to each other, (3) convergent toward apex),
9) puncturation of pronotal disc (3 states according to "reference" specimens: (1) fine, (2) moderate, (3) large),
10) pronotal lateral impression in anterior ⅔ (3 states according to "reference" specimens: (1) distinct, (2) weak, (3) absent),
11) microreticulation of pronotal disc (2 states according to "reference" specimens: (1) distinct, (2) obsolete),
12) size of punctures in elytral rows (2 states according to "reference" specimens: (1) fine, (2) large),
13) punctures of elytral intervals (3 states according to "reference" specimens: (1) weak, (2) distinct),
14) coloration of elytral disc (2 states according to "reference" specimens: (1) darkened, (2) rufous),
15) coloration of elytral suture (2 states according to "reference" specimens: (1) black, (2) rufous),
16) shine of elytron (3 states according to "reference" specimens: (1) shining, (2) weakly shining, (3) dull),
17) length of hind wing (5 states: (1) normally developed, longer than elytron, (2) reaching apex of abdomen, broad, (3) reaching apex of abdomen, narrow, (4) reaching ½ of elytral length, narrow, (5) very short, slightly longer than metathorax),
18) shape of apex of aedeagus (3 states according to "reference" specimens: (1) rounded, (2) weakly protruding, (3) greatly protruding).

Figure 69. Variability of *Ch. pesudolurida.*

region	total number ♂ / ♀	ratio: length / width: min. – max. (average)	ratio of average length ♀ / length ♂	ratio: width of pronotum / length of pronotum: min. – max. (average)
France	1/2	1.3–1.8 (1.5)	1.0	2.1–2.2 (2.1)
Italy	5/7	1.4–1.7 (1.5)	1.2	1.8–2.2 (2.0)
Poland, Lithuania, European Russia (W, N-W, Centre)	21/12	1.4–1.7 (1.5)	1.1	1.9–2.3 (2.1)
Hungary	2/3	1.5–1.7 (1.6)		2.0–2.1 (2.1)
Bulgaria	0/1	1.5	?	2.0
Yugoslavia, Greece	3/4	1.4–1.7 (1.6)	1.0	2.0–2.2 (2.1)
Ukraine, Crimea, Moldova	18/26	1.4–1.7 (1.5)	1.1	1.9–2.2 (2.1)
Crimea separately	15/15	1.4–1.7 (1.5)	1.1	1.9–2.2 (2.1)
Turkey	6/7	1.5–1.7 (1.5)	1.1	1.9–2.2 (2.1)
European Russia(S-E, E), W Siberia, W Kazakhstan	11/14	1.3–1.6 (1.5)	1.1	2.0–2.2 (2.1)
N and W Caucasus	9/10	1.4–1.7 (1.5)	1.2	1.8–2.3 (2.0)
Georgia, Armenia, Azerbaijan	41/23	1.3–1.8 (1.6)	1.1	1.8–2.2 (2.0)

Legend: regions, from which very few specimens, are marked in gray

Figure 70. Variability of *Ch. pesudolurida.*

region	shape of pronotal lateral sides in anterior ⅔ (%)		
	1	2	3
France	0	0	100
Italy	0	8	93
Poland, Lithuania, European Russia (W,N-W, Centre)	15	27	58
Hungary	20	0	80
Bulgaria	0	0	100
Yugoslavia, Greece	0	43	57
Ukraine, Crimea, Moldova	2	9	89
Crimea separately	3	3	94
Turkey	0	8	92
European Russia(S-E, E), W Siberia, W Kazakhstan	0	24	76
N and W Caucasus	5	37	58
Georgia, Armenia, Azerbaijan	6	28	66

Legend: regions, from which very few specimens, are marked in gray

Figure 71. Variability of *Ch. pesudolurida.*

region	puncturation of pronotal disc (%)		
	1	2	3
France	100	0	0
Italy	75	25	0
Poland, Lithuania, European Russia (W, N-W, Centre)	73	27	0
Hungary	60	40	0
Bulgaria	0	100	0
Yugoslavia, Greece	57	43	0
Ukraine, Crimea, Moldova	25	61	14
Crimea separately	20	63	17
Turkey	23	38	39
European Russia(S-E, E), W Siberia, W Kazakhstan	32	68	0
N and W Caucasus	53	42	5
Georgia, Armenia, Azerbaijan	38	57	5

Legend: regions, from which very few specimens, are marked in gray

Figure 72. Variability of *Ch. pesudolurida.*

region	microreticulation of pronotal disc (%)		pronotal lateral impression in anterior ⅔ (%)		
	1	2	1	2	3
France	100	0	0	100	0
Italy	25	75	33	33	34
Poland, Lithuania, European Russia (W,N-W, Centre)	48	52	9	27	64
Hungary	20	80	0	20	80
Bulgaria	100	0	0	0	100
Yugoslavia, Greece	43	57	14	43	43
Ukraine, Crimea, Moldova	82	18	7	30	63
Crimea separately	90	10	7	30	63
Turkey	92	8	8	46	46
European Russia(S-E, E), W Siberia, W Kazakhstan	80	20	4	40	56
N and W Caucasus	68	32	5	58	37
Georgia, Armenia, Azerbaijan	70	30	5	23	72

Legend: regions, from which very few specimens, are marked in gray

Figure 73. Variability of *Ch. pesudolurida.*

region	color of elytral disc (%)		shine of elytron (%)		
	1	2	1	2	3
France	0	100	0	33	67
Italy	8	92	58	34	8
Poland, Lithuania, European Russia (W,N-W, Centre)	42	58	36	52	12
Hungary	40	60	40	40	20
Bulgaria	0	100	0	100	0
Yugoslavia, Greece	0	100	43	57	0
Ukraine, Crimea, Moldova	7	93	7	84	9
Crimea separately	7	93	3	87	10
Turkey	0	100	0	77	23
European Russia(S-E, E), W Siberia, W Kazakhstan	24	76	8	64	28
N and W Caucasus	0	100	26	42	32
Georgia, Armenia, Azerbaijan	0	100	14	63	23

Legend: regions, from which very few specimens, are marked in gray

Figure 74. Variability of *Ch. pesudolurida.*

region	punctures in elytral rows (%)		punctures in elytral intervals (%)	
	1	2	1	2
France	0	100	33	67
Italy	8	92	17	83
Poland, Lithuania, European Russia (W,NW, Centre)	42	58	64	36
Hungary	40	60	20	80
Bulgaria	0	100	100	0
Yugoslavia, Greece	0	100	86	14
Ukraine, Crimea, Moldova	7	93	43	57
Crimea separately	7	93	47	53
Turkey	0	100	69	31
European Russia(S-E, E), W Siberia, W Kazakhstan	24	76	80	20
N and W Caucasus	0	100	68	32
Georgia, Armenia, Azerbaijan	0	100	38	62

Legend: regions, from which very few specimens, are marked in gray

Figure 75. Variability of *Ch. pesudolurida.*

region	shape of hind wings (%)				
	1	2	3	4	5
France	0	0	100	0	0
Italy	0	0	0	83	17
Poland, Lithuania, European Russia (W, N-W, Centre)	0	6	91	3	0
Hungary	0	20	80	0	0
Bulgaria	0	0	100	0	0
Yugoslavia, Greece	0	0	100	0	0
Ukraine, Crimea, Moldova	18	23	59	0	0
Crimea separately	27	20	53	0	0
Turkey	0	23	77	0	0
European Russia(S-E, E), W Siberia, W Kazakhstan	32	28	40	0	0
N and W Caucasus	0	21	79	0	0
Georgia, Armenia, Azerbaijan	0	13	87	0	0

Legend: regions, from which very few specimens, are marked in gray

Figure 76. Variability of *Ch. pesudolurida.*

region	width of 1st fore-tars. ♂ (mm): min.–max. (aver.)	aedeagus: length / width: min.–max. (average)	shape of apex of aedeagus (%)		
			1	2	3
France	0.31	4.4	0	100	0
Italy	0.25–0.34 (0.28)	3.3–4.0 (3.7)	60	40	
Poland, Lithuania, European Russia (W, N-W, Centre)	0.22–0.28 (0.25)	3.8–4.5 (4.1)	48	10	42
Hungary	0.18–0.18 (0.18)	4.0–4.0 (4.0)	0	50	50
Bulgaria	?	?	?	?	?
Yugoslavia, Greece	0.26–0.31 (0.29)	3.7–4.2 (4.0)	33	67	0
Ukraine, Crimea, Moldova	0.23–0.31 (0.27)	3.7–4.7 (4.1)	22	61	17
Crimea separately	0.23–0.31 (0.28)	3.7–4.7 (4.1)	13	74	13
Turkey	0.22–0.29 (0.26)	3.8–4.3 (4.1)	67	33	0
European Russia(S-E, E), W Siberia, W Kazakhstan	0.26–0.31 (0.27)	3.0–4.1 (3.7)	0	80	20
N and W Caucasus	0.23–0.29 (0.26)	3.7–4.3 (4.0)	33	33	34
Georgia, Armenia, Azerbaijan	0.25–0.31 (0.28)	3.9–4.9 (4.2)	53	42	0

Analysis of the geographical variability of *Ch. pseudolurida*.

1) body shape (ratio: length / width) – very slightly varies.

2) dimorphism in body size (ratio: average length of female / average length of male) – slightly varies.

3) proportions of pronotum (ratio: width / length) very slightly varies.

4) shape of pronotum – geographically variable feature, but subspecific level of difference is not observe in any region.

5) puncturation on pronotal disc – in general, the western part of the range is characteristic of a smaller puncturation than the eastern part, but there is no subspecific difference.

6) microreticulation of pronotal disc – obsolete microsculpture predominates in the western part of the range, strong microsculpture predominates in the eastern part. The **subspecific level** of difference is observed between the **specimens from Italy** and from the rest of the specific range, except the rest parts of Western Europe + N-W, W, C European Russia. The latter regions are the zone of intergradation of the subspecies.

7) presence of lateral impression in anterior ⅔ of pronotum – variable feature, but subspecific level of difference is not observe in any region.

8) shine of elytron – variable feature, but subspecific level of difference is not observe in any region.

9) coloration of elytral disc – Poland, Lithuania, European Russia, W Siberia and W Kazakhstan are characterized by a significant proportion of the specimens with a darkened disc of elytra, but there is no subspecific level of difference.

10) coloration of elytral suture – character of no variability.

11) size of punctures in elytral rows – larger punctures predominate in the specimens from Italy, Ukraine, Crimea, Moldova and Transcaucasia, the smallest ones – in the specimens from the east part of the range (E and S-E European Russia, W Siberia, W Kazakhstan). There are no distinct subspecific differences for any territory.

12) puncturation of elytral intervals – weakly variable character.

13) shape of hind wings – specimens from **Italy** are characteristic by very short wings. It is a **subspecific level** of difference. A large proportion of the specimens with normally developed wings is observed in Ukraine, Crimea, Moldova, S-E and E European Russia, W Siberia and W Kazakhstan, but there is no subspecific level of difference.

14) width of 1st fore-tarsomere in male – weakly variable character.

15) proportions of aedeagus (ratio: length / width) – on average, the specimens from Italy differ from all others, but the limits of variability overlap.

16) shape of apex of aedeagus – very variable character, however, the geographical differences are not observed.

Analysis of the types and systematic position of the taxa.

1) *Chrysomela lurida pseudolurida* Roubal, 1917. Three females (syntypes) and three topotypes (2 males, 1 female from Kislovodsk) are studied. The name *pseudolurida* is a valid one for the species in question. See also Comm. 142.

2) *Chrysolina* (*Taeniosticha*) *lurida jailensis* Bechyné, 1952a. I examined one syntype, male (*Taeniosticha* figure 52) and 30 more specimens from the different places in the Crimea (S-W, W, E parts of the Peninsula, northern foot-hills of the Crimean Mts., the south coast) are studied. After the original description 1) body is considerably elongated, 2) pronotum is strongly transverse, 3) pronotal lateral sides are weakly rounded and weakly convergent forward, 4) pronotal disc is shining, without distinct microreticulation, 5) elytral intervals are punctate. Available specimens

from the Crimea does not differ from those from other regions by any of the above-mentioned characters. Other states of the characters 3 and 4 prevail than noted in the original description. Thus, a subspecies is not confirmed.

3) *Chrysolina* (*Taeniosticha*) *lurida lineata* Bechyné, 1952a. Type of this taxon is a type of the unavailable name *lineata* Papp 1946. The latter was described based on three syntypes. After Papp (1946), elytral suture is broadly and strongly blackened. Bechyné (1952a) also noted on the darkened suture. I did not have the opportunity to study the types or any specimens from the type locality, Romania. Among more than 200 specimens being at my disposal, the coloration of the elytral suture does not vary in the range. This taxon remains unclear. Perhaps this is a very local form.

4) *Chrysolina* (*Taeniosticha*) *lurida mangaliana* Bechyné, 1952a was described from Bulgaria based on the unrecognized number of specimens. After the original description, this subspecies is characteristic of the following features: 1) body is smaller than *pseudolurida* s.str., 5–5.5 mm long, 2) puncturation of elytral rows is very strong, 3) elytra parallel-sided, body is very elongate, 4) pucturation on pronotal disc is distinct, 5) pronotal lateral callus is separated from the disc in basal part only, 6) aedeagus is narrow, 7) elytral intervals are strongly punctate, 8) pronotum is less than 3 X as wide as long, 9) lateral sides of pronotum are distinctly convergent forward.

I examined two type specimens (male, *Taeniosticha* figure 53, and female), 4 topotypes (male, 3 females) and 2 more specimens (male and female) from Bulgaria. Their characters in the comparison with the original description (see above) are following: 1) body is not smaller than *pseudolurida* s.str., 2) puncturation of elytral rows as in other subspecies, varies in size, 3) shape of elytra as in other subspecies, 4) pucturation on pronotal disc is fine, partly obsolete or distinct, 5) pronotal lateral impression is very short in male, as long as 1/5 pronotum, but it is longer, up to ¼ of pronotum in other specimens, 6) aedeagus is similar with other subspecies, 7) elytral intervals are more largely punctate in two type specimens, they are finely punctate in other specimens, 8) shape of pronotum is similar to that in other subspecies, 9) lateral sides of pronotum are distinctly convergent forward in all examined specimens from Bulgaria. I think that distinguishing characters of the male type specimen, namely strong puncturation in elytral rows and intervals, very short pronotal lateral impression, represent individual variability. These differences are not traced on other specimens.

The most features in the original description are either most typical of the specimens from different parts of the range (e.g., the 8th one), or they are variable and occur in all parts of the specific range. Therefore, I believe that a subspecies with the above mentioned characters can not exist.

5) *Chrysolina* (*Taeniosticha*) *lurida nevesinjensis* Bechyné, 1952a was described based on the series of the specimens from Bosnia. After the original description, this subspecies is characteristic of the following features: 1) pronotum is much than 3 X as wide as long, 2) body is very short-oval (male) or hemispherical (female), 3) puncturation of elytral intervals is distinct, 4) pronotal lateral sides are weakly rounded and slightly convergent forward. I examined one syntype, male (*Taeniosticha* figure 54), and five topotypes, which were collected by the same collector as syntypes, two more specimens from Bosnia and one – from Serbia. The 1st character of the original description does not correspond to either topotypes or the other specimens. This feature is probably indicated by the author inaccurately, without measurements. Characters 2nd and 3rd does not permit to distinguish the specimens from Balkans from other. The 4th character is really the most developed in the specimens from Balkans, while it is not observed in two of the five topotypes, but is present in significant proportions of specimens from different regions. The subspecies is not confirmed.

6) *Chrysolina* (*Taeniosticha*) *lurida obscurefacta* Bechyné, 1952a was described by the series of syntypes from Italy. I studied one syntype (*Taeniosticha* figure 55), five topotypes and seven additional specimens from Italy. After original description, subspecies *obscurefacta* differs from other subspecies in: 1) pronotal lateral callus separated from the disc along entire length, 2) pronotal disc with distinct microreticulation, 3) elytral intervals finely punctate, 4) elytral disc usually darkened, 5) aedeagus broad, 6) females distinctly larger than males, 7) pronotum less than 3 X as wide as long, 8) pronotal lateral sides distinctly convergent forward.

These characters in the Italian specimens being at my disposal are as follows: 1) callus is more developed than in any other regions, this character presents in ⅓ of the Italian specimens, 2) microreticulation does not distinguish Italian specimens from the others, 3) puncturation of elytral intervals is more developed than in any other regions, presents in 17 % of Italian specimens, 4) coloration of elytral disc does not distinguish Italian specimens from the others, 5) aedeagus is more broad than in other regions except E and S-E European Russia, W Siberia, and W Kazakhstan, 6) difference in body size of female and male is more distinct than in any other region, 7) proportions of pronotum does not distinguish Italian specimens from the others, 8) shape of pronotal sides does not distinguish Italian specimens from the others. Besides that, Italian specimens are characteristic of the great reduction of the hind wings. I think it is a separate subspecies with wings strongly reduced, narrow, reaching at most elytral mid-length.

7) *Chrysolina* (*Taeniosticha*) *samarensis* Bechyné, 1950a was described based on the series of syntypes from Totskoye vill., Totskiy Distr., Orenburg reg., S-E of European Russia. After the original description, *Ch. samarensis* differs from *Ch. pseudolurida* as follows: 1) elytra dull, 2) elytral intervals distinctly punctate, 3) antennae longer, 4) male tarsi narrower, 5) aedeagus (after the original figure) strongly narrowed at apex, much stronger than in *pseudolurida*.

I studied one syntype, one topotype, and additional specimens from S-E European Russia, W Siberia, and W Kazakhstan. Characters of the available specimens are following: 1) ⅓ of the specimens from the area of *samarensis* have dull elytra; besides them, only specimens from Turkey and the Caucasus are characteristic of such proportion of dull elytra; this character is less developed in other regions, 2) puncturation of elytral intervals does not distinguish the specimens from the area of *samarensis* from the others, 3) length of antennae does not distinguish the specimens from the area of *samarensis* (character was studied at a qualitative level) from the others, 4) shape of male tarsi and 5) shape of aedeagus does not distinguish the specimens from the area of *samarensis* from the others. Distinguishing character of *samarensis*, namely darkened elytral disc, presents in ¼ of the specimens of *Ch. pseudolurida*. This state of the character is rare in other regions except Poland, Lithuania, W, N-W and C of European Russia, where it is observed in 42% of the specimens. Thus, a specific or subspecific rank of the name *samarensis* is not confirmed.

268. *Ch. tuvensis* L.Medvedev, 1976 was originally placed near *Ch. sahlbergiana*. Subsequently (Bieńkowski, 2001), it was considered to be a member of the subgenus *Pezocrosita*. Bourdonné (2005) transferred *tuvensis* to the subgenus *Taeniosticha*. In fact, *Ch. tuvensis* is rather morphologically close to the members of *Taeniosticha*. Now I think, that *tuvensis* belongs to the subgenus *Jeanclaudia* based on the combination of the male characters (see Review of the subgenera, differential diagnosis of *Jeanclaudia*).

269. Available specimens of *tortipennis*, including that compared by E. Reitter with the type of *pertusa*, correspond to interpretation of *tortipennis* in Marseul (1886) and recent literature (Warchałowski, 2003). Synonymy *tortipennis* = *pertusa* was established by Bourdonné, Doguet

(1991) based on the examination of the types of both taxa. In my opinion, the name *tortipennis* in Peyerimhoff (1938) belongs to *Ch. afra* (pronotal lateral calli are separated from the disc along entire length).

270. *Ch. mairei* was originally described based on one immature specimen with red pronotum. A normal black coloration was not yet developed in this beetle, as the author noted subsequently (Peyerimhoff, 1939). However, Warchałowski (2003) erroneously considered this unusual coloration (head and elytra black, pronotum red) to be typical of this species.

271. *Ch. korbi* was originally described to be close to *Ch. helopioides*. Both species occur in Andalusia. Distinguishing characters, mentioned in the description of *korbi* do not permit to identify the available specimens either as *helopioides* or *korbi*. I think they are conspecific. Bechyné (1950a) considered *korbi* to be a subspecies of *helopioides*. However, the characters mentioned by Bechyné (1950a) also do not permit to distinguish these taxa. Moreover, two subspecies of the same species can not inhabit the same territory.

272. *Ch. rubricrus* is a poorly known taxon. It was described from Mediterranean shore of Algeria and compared only with *Ch. afra*. Original description permits to consider *rubricrus* to be similar with *tortipennis*. In the literature from the end of XIX century to the beginning of XXI century, *Ch. rubricrus* presents only in the key by Warchałowski (2003) (under erroneous name *rubicrus*). Warchałowski (2003) included *Ch. rubricrus* in the group in which "lateral border of pronotum separated basally by furrow". This contradicts to the original description, in which pronotal lateral impressions are described as almost absent. The place of the type deposition of *Ch. rubricrus* is unknown, as for the other Chrysomelidae species described by J. Desbrochers des Loges, except Cassidinae. Available specimens, including those from the type locality of *rubricrus* (Oran) and corresponding to the original description of *rubricus*, belong to *tortipennis*.

273. Taxon *avulsa* was originally described (Bechyné, 1946) as a subspecies of *Ch. fimbrialis*. My investigation of the description of *avulsa* in Bechyné (1946, 1950a), holotype of this taxon (*Threnosoma* figure 38) and additional specimens from type locality, together the specimens from the area of *Ch. fimbrialis* s.str. shown that: 1) difference of pronotum in *avulsa* and *fimbrialis*, mentioned in the original description of the former, is not expressed in all specimens of *avulsa*, 2) puncturation of elytra, as noted in the original description, distinguishes *avulsa* from *fimbrialis*, 3) fine puncturation of the clypeus and obsolete puncturation of frons and vertex (as mentioned in the original description of *avulsa*) are, in fact, variable characters, 4) additional character in the description of *avulsa*, namely body coloration, distinguishes *avulsa* from some specimens of *fimbrialis*. Besides that, *avulsa* is very different from *fimbrialis* in the shape of the aedeagus, as the author (Bechyné, 1946) noted, and Daccordi, Ruffo (1979) confirmed. The intermediate states of the aedeagus shape are unknown. The above-mentioned distinguishing characters such as elytral puncturation and aedeagus structure are sufficient to consider *avulsa* to be a separate species.

274. Subgenus *Ch.* (*Timarchomima*) was originally described to include three species, namely: *indica* (type species), *longicornis*, and *clavareaui*; and a subgenus *Ch.* (*Timarcholina*) – also with three species, namely *templetoni* (type species), *ceylonica*, and *mauliki*. Distinguishing characters of *Timarcholina*, after original description, Bechyné (1950a) are the following: the body is very brightly colored, denticles on 4th tarsomere are more distinct, elytral puncturation sparse, arranged in paired rows (puncturation is irregular in *Timarchomima*), base of antenna is slightly closer to clypeus than to eye (very close to clypeus in *Timarchomima*). Subsequently, *Timarcholina* was

regarded as a composite taxon. *Ch. ceylonica* was transferred to the subgenus *Ch.* (*Pierryvettia*) by Daccordi (1980a). According to Daccordi (1980a), the only constant and characteristic feature to distinguish *Timarchomima* and *Timarcholina* is the puncturation of the elytra, but this is not enough to distinguish the subgenus.

The difference of the subgenera in question by the position of base of antenna is not confirmed by my investigation. Antennal base is closer to clypeus than to eye with the following values: *Timarcholina*: *templetoni* – 1.4 X, *krishnu* – 1.8 X, *andrewesi* – 2–2.7 X, *janczyki* – 3 X, *semifulva* – 3.4 X, *carinata* – 3.4–4.4 X, and *Timarchomima*: *longicornis* – 3.8 X, *indica* – 4.0 X. Denticle on 4th tarsomere presents in *indica* (fine) and in *longicornis* (normally developed). However, in addition to the difference in the elytral puncturation, there is another distinguishing character of *Timarchomima*: *indica* and *longicornis* have immarginated anterior process of the metathorax between mid-coxae. It allowed me (Bieńkowski, 2001) to consider *Timarchomima* as an separate genus close to *Chrysolina*.

275. *Ch. mauliki* was described based on series of syntypes, including males and females. According to the original description, *Ch. mauliki* is well different from *Ch. templetoni* by the puncturation of pronotum and elytra as follows: *templetoni*: pronotum is almost or entirely impunctate, and elytral puncturation is distinct only anteriorly; *mauliki*: pronotum sparsely, but strongly punctate, and elytral puncturation is distinct even at the apex.

Daccordi (1980a) studied a holotype (male) of *templetoni*, including aedeagus structure. I studied a syntype (female) of *mauliki* (male aedeagus was not studied either by the author or by anyone else afterwards) and 10 additional specimens from Sri Lanka, including 7 males. I identify these males as *templetoni* by the aedeagus structure. Puncturation of pronotum and elytra varies in these specimens as follows: 1) punctures are absent at the disc and lateral sides of pronotum, they are very fine in anterior ½ of elytra, absent in the posterior ½; 2) fine punctures present at disc and lateral sides of pronotum and in posterior part of elytron, they are moderately large in anterior part of elytron, 3) large punctures present at lateral sides of pronotum and in anterior part of elytron, fine ones – on pronotal disc and in posterior part of elytron, 4) large numerous punctures present on lateral sides and disc of pronotum and in anterior part of elytron, fine ones – in posterior part of elytron. I observed a similar variability in the available females. Syntype of *mauliki* (female), is identical to some of the studied males by the external characters. Thus, I believe *mauliki* to be conspecific with *templetoni*.

The type of *Ch. iole* was not studied by anyone of the recent authors. The original description of *Ch. iole* is rather short (Stål, 1861), but it does not contradict the characters of *Ch. templetoni*. Weise (1916) cited *iole* as a junior synonym of *templetoni*.

276. A female of *Ch. haemochlora* in MNHN with the labels: "*Chrys. haemochlora*" (original) and "type" (added later) has no more chances to be considered as a syntype than male and female in ZMUH with original labels: "Mont. Altai", "Gebler", "Coll. Mannerh." and bottom label "*Haemochlora* Gebler".

277. Kippenberg (2010) includes *Ch. dhaulagirica* and *Ch. hartmanni* in the subgenus *Diachalcoidea*. However, *Ch.* (*dhaulagirica*) species group differs from *Diachalcoidea* in: 1) prothoracic basal fold absent (distinct in *Diachalcoidea*), 2) tarsomeres 1–3 with entire sole in both sexes (female tarsomeres 1–3 or only 1 with glabrous stripe beneath in *Diachalcoidea*), 3) tarsomere 1 of all tarsi strongly or moderately dilated in male, tarsomeres 1–3 narrow in female (tarsi narrow in both sexes in *Diachalcoidea*), 4) claw tarsomere with 2 very fine denticles beneath

at apical margin (without denticles in *Diachalcoidea*), 5) pygidium with weak or obsolete impression (with distinct furrow along entire length in *Diachalcoidea*).

278. I examined type specimens (males with aedeagus mounted) of both *Ch. sinica* and *Ch. zhongdiana* and found these names to be conspecific. However, lateral impressions at the pronotal base are less developed in the former than in the latter.

279. L. Redtenbacher's collection in NHMW contains two *Chrysolina* specimens (females) associated with the bottom label "*Fimbrialis* Küster / *Molluginis* Dhl.". Both specimens are without geographical labels, but one with label "840.". I designate the latter as syntype of *Molluginis* Redtenbacher. Both specimens are conspecific with *Ch. fimbrialis*. They are black with very weak metallic blue tint dorsally, with elytral epipleuron and the outermost interval red.

280. Holotype of *Ch. tani* was collected by M.M. Berezovsky in April, 1894. Type specimen is labeled in Russian as follows: "Китай, Сан-чжоузи". According to Deuve (2013) and Schütze, Kleinfeld (1995), "Сан-чжоузи" should be uniquely interpreted as "San-dzjao-dze", Heilongjiang Province, N-E China. But this is poorly consistent with other records of this species. There are several specimens of *Ch. tani* from Gansu and Sichuan, and closely related species *Ch. mikhailovi* from Xizang. It is known that Berezovsky, after finishing the 2nd China-Tibet Expedition in Hankow in October 1893, traveled alone to S Gansu and Sichuan and returned to Beijing in February 1895. So, if the collection date of the type *Ch. tani*, April 1894, is correct, then Berezovsky was somewhere in Gansu or Sichuan at that time.

281. *Ch. punjabiensis* was described based on one specimen, without indication of the sex (Abdullah et Qureshi, 1969). The original description includes mainly a coloration of the body. Among the species known from Pakistan, such coloration can be found in *Ch. coerulans bella*. Other characters in the description of *punjabiensis* also do not contradict *Ch. coerulans bella*. Therefore, I believe *punjabiensis* is a synonym of *coerulans bella*.

282. According to the original description, *Ch. mikhailovi* Ge et Daccordi "is similar to *Ch. lishangyini* Daccordi et Ge, but they are distinguished by the morphology of aedeagus and punctures of elytra" (Daccordi, Ge, Cui, Yang, 2011). The description of the elytral puncturation in the descriptions of both species is not different. Difference in the aedeagus structure (Daccordi, Ge, Cui, Yang, 2011): *lishangyini*: "basal part slightly narrower than apex", *mikhailovi*: "basal part as wide as apex", in my opinion are within the limits of intraspecific variability (*Ch.* (*tani*) species group figures 2, 5). In fact, basal part is narrower than the apex even in the paratype of *mikhailovi* in NME.

After that, I examined 9 paratypes of *Ch. markamensis* (males, including. 5 with mounted aedeagus), 40 paratypes of *Ch. mikhailovi* (males, females, including 9 males with mounted aedeagus), and 4 paratypes of *Ch. lishangyini* (females), together with original descriptions of the three above named species. All these taxa are described from S Tibet, from the locations located near each other. Therefore, I believe that they are conspecific, and the different shape of aedeagus is within individual variability.

283. *Ch. dohertyi* was originally described from "Burma: Ruby Mines", the famous Burmese ruby mines in the area called the Mogok Stone Tract in north-central Burma. Then, this species was found in Vietnam (Medvedev, 1987). Yang, et al. (2015) recorded it from Yunnan.

Comments

Daccordi et Yang in: Ge, Daccordi, Yang (2009) described *Ch. jelineki* from Yunnan. According to the original description, *jelineki* differs from *dohertyi* as follows: 1) antennomeres 6–11 not strongly thickened (original description of *dohertyi*: "thickened, not specified"), 2) scutellum with sparse punctures (original description of *dohertyi*: "impunctate"), 3) apex of aedeagus broader in dorsal view (was not mentioned in original description of *dohertyi*, but examined by Daccordi et al., 2009).

I studied 14 males and 16 females from Yunnan + 23 paratypes of *jelineki* (including 7 males with mounted aedeagus) and 1 male from Vietnam. Specimens from Yunnan have the following characters: 1) antennomeres 6–11 variable, from narrow to moderately thick, 2) scutellum with a group of distinct punctures in basal ⅓, or with sparse very fine punctures at base, or impunctate, 3) apical projection of aedeagus variable, from narrow (as in type of *dohertyi*) to broad; this character does not correlate with the thickness of the antennomeres, e.g., a male with narrow apical projection of aedeagus may have narrow antennomeres. Therefore, I believe *dohertyi* and *jelineki* to be synonyms.

284. The original description of *Chrysomela ambulans* Faldermann, 1835 is cited below:
"Ovalis, aenea, valde convexa, thorace impunctato, polito, margine laterali aequaliter valde incrassato; elytris profunde punctato-striatis, interstitiis laevissimis.

Longit. 3–3 1/2 lin. Latit. 2 1/4, 2 1/2 lin.

Statura et magnitudine fere *Chrysomelae geminatae* Payk. apice tamen et postice magis attenuata, elytris plerumque fortius punctatis, et interstitiis striarum in nostra laevibus.

Caput breve, deflexum, apice rotundatum, supra laeve, impunctatum, aeneum, nitidum, supra os fere semi-circulariter sed parum depressum; ore ferrugineo. Oculi magni, nigri. Antennae dimidio corpore parum breviores, ferrugineae, extrorsum sensim crassiores, subtiliter pubescentes.

Thorax transversus, longitudine plus duplo latior, basi obtuse rotundatus, anguste aequaliter marginatus, angulis rectis, acutis, apice late, sed haud profunde emarginatus, angulis sat deflexis, acuminatis, postice paullo latior, lateribus fere rectis, acute marginatis, ante medium vix rotundatis, et ante angulum posticum subtiliter sinuatis, supra parum convexus, impunctatus, politus, aeneus, margine laterali a basi usque ad apicem late sed aequaliter incrassatus, intra marginem lateralem autem canaliculo angusto et sat profundo impressus.

Scutellum parum elongatum, apice acuminatum, supra laeve, obscure aeneum.

Elytra aenea, laevissima, basi thoracis latitudine, dein medium versus subdilatata, rotundata, postice angustata, apice rotundata, supra ante medium convexa, postice valde fornicata, ad apicem retusa; singula striis decem e punctis majoribus profunde impressis formatis, interstitiis impunctatis, politis, nitidis.

Corpus subtus fusco-aeneum, nitidum; abdomine punctis quibusdam impresso, et segmentorum lateribus tenuiter foveolatis.

Pedes mediocres, fusco-aenei, distincte ac vage punctati; tarsorum articulo ultimo apice ferrugineo.

E viciniis urbis Irkutzk.

In Museo Faldermanni missa a D. Turczaninoff."

285. The original description of *Chrysomela caerulea* Gmelin, 1790 is cited below:
"Chr. caerulea, thorace violaceo. Geofr. ins. par. I. p. 259. n. 6.
Habitat in Gallia."

286. The original description (Swartz in: Schönherr, 1808) of *Chrysomela liturata* Swartz, 1808 is cited below:
"virescens, elytris flavis punctato-striatis, lituris 8 nigro-cyaneis, interruptis.

Habitat Cantonae Sinarum.

D.D.J. Lund. E Mus. Schönherr.

Magnitudine & statura fere *Chr. alternantis*, tota glabra. Caput virescens; antennis rufis. Thorax convexus, immarginatus tenuissime punctulatus, cyaneo-virescens. Elytra convexa, immarginata flava, lituris latiusculis in singulo 4 & sutura nigro-cyaneis interruptis, maculis oblongas (15) paralellas mentientibus, punctulis ordine duplice notatis. Subtus omnia, praeter tarsos rufos, atro-violacea, nitida. – Tab. 4. fig. 8. b. magnitudo naturalis; – a. aucta."

Figure 77. *Chrysomela liturata* Swartz, 1808, total dorsal view. (After: Swartz in: Schönherr, 1808)

The type locality of *Ch. liturata* is Canton (= Guangzhou city, Guangdong Province, S China). However, beetles with such characters (Fig. 77) are not found in China till now (Yang, et al., 2015). This is probably conspecific with *Ch. picturata* (= *catenata*) (Fig. 78) inhabiting S Africa, and therefore a type locality of *liturata* is incorrect. Examination of the type of *liturata* (NRS) is necessary to answer this question.

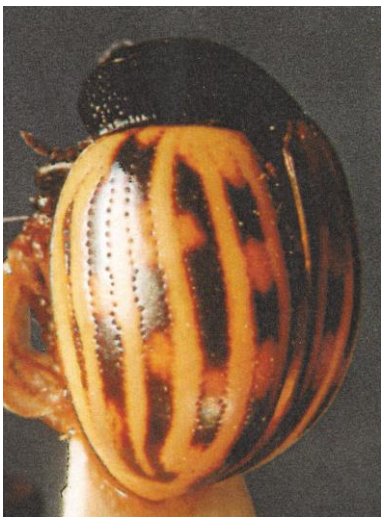


Figure 78. Syntype of *Ch. catenata* (MNHUB), total view. (Photo by M. Daccordi)

287. The original description (Duftschmid, 1825) of *Chrysomela praticola* is cited below:
"Oblongo-ovata, subtus violacea, supra atro-coerulea, elytris disco laevius, extrorsum crassius punctatis, antennis fusco-testaceis.

Var. β. Supra obscure coeruleo-viridescens.

Vierthalb Linien lang, die Unterseite veilchen-blau, eben so die Füsse. Die Fühlhörner schwärzlich braun. Die Oberseite dunkelblau, oder dunkelblau grünlich. Das Halsschild in der Mitte fein punctirt, mit einer schmalen glatten Längsstreife, die einem Exemplare vorzüglich deutlich ist; seine etwas aufgeworfenen Seiten tiefer und gröber punctirt, die Flügeldecken sind verworren punctirt, die Puncte gegen die Naht zu feiner, gegen außen immer stärker und gröber. Von der *Chrys. Hottentota*, der er sehr ähnlich ist, unterscheiden ihn Seine länglichere Gestalt, und die aufgeworfenen Seiten des Halsschildes hinlänglich. Ich hätte ihn für die *Chrys. aethiops* F. gehalten, wenn mir nicht das "corpus subtus obscurum" und vorzüglich das "elytra subtilissime punctata" im Wege ständen. – Zwe Mahl um Linz."

288. The original description (Brullé, 1838) of *Chrysomela rufipes* Brullé, 1838 is cited below:

"Jolie petite espèce voisine de celle appelée *Pyndosa.* Elle est d'une couleur de bronze assez brillant, ovale, et le corselet obscur; les élytres offrent plusieurs stries longitudinales de petits points enfoncés; les antennes, le bout des jambes et des tarses sont d'un roux obscur; la partie infédu thorax est fortement ponctuée. Longueur, 2 lignes; largeur, 1 ligne."

289. The original description (Goeze, 1777) of *Chrysomela Violacea* Goeze, 1777 is cited below:
"Geoffr. Ins. Tom. 1. p. 259, Chrys. 6. La Chrysomele bleue à corselet violet.
Coerulea, thorace violaceo."
"*) Hiervor giebt es noch eine Varietät thorace nigro-violaceo."

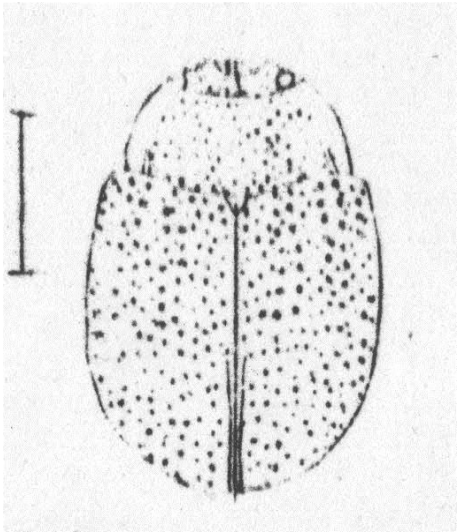
290. The original description (Degeer, 1778) of *Chrysomela violaceocoerulea* Degeer, 1778 is cited below:
"La Chrysomele bleu a corselet violet. Long. 4 lig. Larg. 2 1/2 lig. *C. coerulea*, thorace violaceo.
Variet. ead. thorace nigro-violaceo."

291. The original description (Fabricius, 1798) of *Chrysomela obscurata* Fabricius, 1798 is cited below:

"*C*[*hrysomela*] supra obscure aenea thorace glaberrimo, elytris vage punctatis. Habitat in Germania Dom. Daldorff.

Statura et magnitudo *C. Bankii*. Caput et thorax obscure aenea, nitida, glaberrima thoracis margine nullo modo incrassato. Elytra vage punctata. Antennae, corpus, pedes nigra, immaculata."

292. The present diagnosis of *Chrysomela florea* Herrich-Schaeffer, 1839 is compiled from the original key to species (Herrich-Schaeffer, 1839):
"Dunkel (schwarz, blau, blaugrün, erzfarbig) oder mit in bunten Farben wechselnden Längsstreifen, nie goldgrün."
"Decken ohne Spur der glatteren Längsstreifen."
"fast eckig oval."
"Die ganz groben Punkte der Decken gegen den Aussenrand ziemlich deutlich gereiht, dazwischen kaum feinere Punkte sichtbar."



"Schwarz, Kopf grösser, Thx feiner punktirt, der Rand schmaler, hinten durch deutlicheren Eindruck geschieden. GeStålt etwas schmaler, hinten spitzer. <...> var? Schön dunkelblau."

Chrysomela florea is usually considered as a synonym of *Ch. vernalis vernalis* (Brullé, 1832). However, the original description and figure of *florea* (Fig. 79) are considerably

differ from *vernalis*: pronotum with lateral callus distinctly separated from disc only posteriorly, all large elytral punctures arranged in rows, elytral intervals without fine punctures (as stated in the description, the figure does not confirm), pronotum strongly rounded laterally.

Figure 79. *Chrysomela florea*, total dorsal view. (After: Herrich-Schaeffer, 1839)

293. The original description (Maxwell-Lefroy, 1909) of *Chrysomela Pascoei* Maxwell-Lefroy, 1909 is cited below:

"*Chrysomela* includes a variety of moderate-sized beetles, some of bright colours, the commonest plains species of a dull black colour, two are abundant, the spotted *Chrysomela*, *C. guttata*, Geb., and the unspotted species *C. Pascoei*, Jac."

The author, Maxwell-Lefroy (1909) attributed the name *Chrysomela Pascoei* with M. Jacoby. However, Jacoby did not describe this taxon. Formally, *pascoei* is an available name, because it is accompanied by a description of the distinctive features, as well as a type locality, "tropical India". Maulik (1926) considered it to be a synonym of *Ch. coerulipes*, but there is no certainty of the correctness of this decision.

294. The original description (Hornstedt, 1788) of *Chrysomela ferruginea* Hornstedt, 1788 is cited below:

"Der rostfarbige Blatkäfer".

"Gyrund, Kopf, Brustschild und Füsse rostfarbig, die Deckschilde schwarz kupferglänzend, der innre Rand rostfarbig.

Chr. ovata, capite, thorace pedibusque ferrugineis, elytris nigro-aeneis, margine interiore ferrugineo.

Er ist in Malakka, Sumatra und Yava zu Haufe.

Der Leib eyrund, die Grösse und GeStålt der *Chr. marginata*, ohne Rand. Keine Lippe; die Kinnladen stark, mit scharfen Spißen, rostbraun; zwey fadenförmige Freßspitzen. Die Augen rund, schwarz. Die Fühlhörner beym Männchen schnurförmig, ausserhalb dicker, so lang, wie der Brustschild, die ersten fünf Glieder rostfarbig, die übrigen sechs schwarz, der Brustschild schwach gerandet, rostfarbig, glänzend. Das Schildlein dreyeckig, rostfarbig, die Deckschilde gewölbt, schwarz kupferglänzend, der Aussenrand schwach rostfarbig. Die Flügel durchscheinend, adrig. Von den Bauchringen sind vier schwarz kupferglänzend, das lezte rostfarbig. Die 6 Lauffüsse rostfarbig. Die Hüften wenig dicker, als die Schienbeine, diese so lang, als die Hüften, die Fussblätter dreygliedricht, mit einer doppelten Klaue."

Gmelin (1790) in the description of his *Chrysomela malaccensis* repeated the Latin diagnosis by Hornstedt (1788) and added a bibliographic reference to the original description as follows: "Chr. capite, thorace pedibusque ferrugineis, elytris nigro-aeneis, margine interiori ferrugineo. Hornst. Schrift. berl. Naturf. 8. I. p. 2. t. I. f. 9. "

Chrysolina ferruginea (= *malacensis*) is cited by Kimoto (1984) and Mohamedsaid (2004) as a valid species to occur in Malaya, Sumatra, and Java.

295. The subspecies *fuliginosa microsticha* was originally described on the base of the specimens from San Remo, N Italy. According to the original description, this subspecies is characterized by the following features: lateral sides of pronotum straight along entire length or slightly concave, and elytral punctures finer and shallower than in other subspecies. I examined two males, syntypes of *microsticha*. Besides that, I examined the specimens from the type locality and, in addition, the specimens of *fuliginosa* from Genoa, Marseilles, and different localities in Germany and France. I

found that shape of pronotal lateral sides is variable. In the syntypes of *microsticha*, they are slightly rounded in anterior ¼ and straight in posterior ¾. In most specimens from Germany and France, lateral sides are rounded in anterior ¼, but in several specimens, lateral sides are straight along entire length. On the other hand, in 2 females from Marseilles, elytral punctures are very fine, but pronotal lateral sides rounded in anterior ¼. Elytral punctures does not differ in syntypes of *microsticha* and other specimens of *fuliginosa*. Therefore, I confirm the synonymy *fuliginosa* s.str. = *microsticha*.

Besides the specimens from S France and N Italy, I found in FNMS one female conspecific to subsp. *microsticha*, however bearing label "Hungaria" and identified by J. Bechyné as subsp. *microsticha*. I think that this geographical label is incorrect.

296. Bechyné (1952a) and Bieńkowski (2001) included *Chrysomela sibirica* in the subgenus *Allohypericia* as a subspecies of *Chrysolina aeruginosa*. Later, I examined one syntype (female) of *Chrysomela sibirica*, in which dorsum is shining, black, pronotal lateral sides are arc-shaped and strongly convergent from base to apex, pronotal lateral impressions forming narrow deep furrows in basal ⅓ and shallow wide impressions covered by numerous large punctures in anterior ⅔; elytra with closely paired rows of large, dense punctures; tarsomeres 1–3 with entire sole, length 7.2 mm. All these characters permit me to consider *Chrysomela sibirica* to be conspecific with *Chrysolina* (*Hypericia*) *difficilis ussuriensis* (Jacobson, 1901b) in recent interpretation (Medvedev, 1992a). Jacobson (1901b) offered a name *ussuriensis* (without description) for *aeruginosa* sensu Weise (1887a) nec Faldermann (1835). A description of *aeruginosa* sensu Weise (1887a) is brief und uncertain: "Sie ist den oberseits metallisch braunen oder dunkel oliven-grünen Stücken der *salviae* täuschend ähnlich, jedoch bei gleicher Länge etwas breiter und gewölbter, durchgängig stärker punktirt, ein Spur glänzender, die Punkte in den Doppelreihen der Fld. sind etwas dichter gestellt und die Tarsen besitzen eine ganze Filzsohle, ...". Unfortunately, I could not find the specimen identified by J. Weise as *aeruginosa*. Therefore, I confirmed the recent interpretation of *ussuriensis* sensu Medvedev, 1992 and offered the synonymy: *Chrysomela sibirica* Weise, 1887a = *Ch. ussuriensis* Jacobson, 1901b. The latter name is valid because *sibirica* Weise is junior homonym.

297. The name *Chrysomela cyanella* Gebler is a junior primary homonym of *Chrysomela cyanella* Linnaeus. However, the letter taxon since 1798 was excluded from the genus *Chrysomela* because it was included in the genus *Lema* Fabricius, 1798. In this case, ICZN (1999, 23. 9. 5). directs to keep the prevailing usage of the both names and ask the International Commission on Zoological Nomenclature to use its plenary power.

298. The name *Atechna* was established by Chevrolat (1833). Although the name *Atechna* was not originally supplied with the diagnosis or description, it was originally associated with 19 species names. Six of them are considered as available ones presently: *guttata, quatuordecimguttata, vulpina, alternans, striata,* all from S Africa, and *trilineata* Boisduval, 1835 from Australia. The latter, *trilineata*, was recently considered as a member of the genus *Pyrgoides* Aslam, 1968 (after Seeno, Wilcox, 1982). Therefore, the name *Atechna* is available according to ICZN (1999: 12.2.5). The type species for *Atechna* was not designated by Chevrolat (1833). Monrós, Bechyné (1956) designated one of the species originally included in *Atechna*, namely *Chrysomela striata* as a type species. Later Silfverberg (1980) and Daccordi (1980b) proposed another type species, namely *Chrysomela vulpina* Fabricius and *Chrysomela duodecimguttata* Thunberg, respectively. Despite this fact, the type species of *Atechna* is *Ch. striata* (ICZN, 1999: 69.1).

299. Fairmaire (1888a) described *Chrysomela foveopunctata* from Yunnan. It was subsequently included in the species *Ch. separata* as a subspecies (Bechyné, 1950a). Bechyné (1950a) noted that *foveopunctata* distributes in Laos and N Vietnam too, that is, in the area of *separata*. Differences of *foveopunctata* from *separata* are included in the original description of *foveopunctata*, and also in the differential diagnosis of *Ch. tonkinea* (the latter was described by Fairmaire from N Vietnam and subsequently synonymized with *separata* by Bechyné (1950a)).

The main distinguishing characters (after Fairmaire, 1888a,b) are the following:

1(2) Larger, 8.5 mm long, very convex, more rounded laterally, anterior pronotal corners obtuse (well visible in dorsal view), elytral punctures larger and sparser, pronotal lateral sides more swollen, lateral impression distinct.

foveopunctata

2(1) Smaller, up to 7 mm long, less convex, less rounded laterally, anterior pronotal corners distinct (well visible in dorsal view), elytral punctures slightly smaller and more numerous, pronotal lateral sides less inflated, pronotum without lateral impression.

tonkinea (=*separata*)

Having examined a type of *Ch. foveopunctata* , I came to conclusion that it is separate species belonging to the species group *Ch.* (*zhongdiana*). The distribution of this taxon in Laos and Vietnam should be confirmed.

300. The subspecies *Ch. romani burjatica* was described (Mikhailov, 2007b) based on two specimens (male and female). It is insufficient to recognize the geographic nature of the observed variability and to separate a subspecies.

301. *Ch. seriepunctata* is firstly recorded from Japan by Saitoh, Minami (2016).

302.The name "*Athecna* Chevrolat" with type species "*Chrysolina duodecimguttata* (Thunberg) = *quattordecimguttata* [sic!](Fabricius)" and reference to "Chevrolat, L., 1843. – in d'Orbigny, Dictionnaire d'Histoire Naturelle. Paris, III: 654–657" was cited by Daccordi (1976c, 1980b, 2001). I could not find another mention of the name *Athecna*, except Daccordi (1976c, 1980b, 2001). D'Orbigny cited the name *Atechna* Chevrolat [not *Athecna*!] on page 282 in the volume 2 of the "Dictionnaire..." (Orbigny, 1845), while the volume 3 was published in 1844 and included the words beginning with letter "C".

Athecna: Daccordi, 1976c, 1980b, 2001 is definitely an incorrect subsequent spelling. It is unavailable.

303. *Ch. kabaki* is known, besides E Kazakhstan, from Russia: the Altai Republic, Chemal vill., and Altai Krai, envir. Aya lake, Chertov Kogot' Forestry, Katun' river valley.

304. *Ch. aeneolucens* var. *melanaspis* was originally described on the base of uncertain number of specimens from the same locality as *Ch. aeneolucens* s.str. The type specimens of *melanaspis* are not found in NMP. I found in the material from J. Achard collection (integrated in NMP main collection by J. Bechyné) only one specimen (female) labeled "Coll. Achard" and without any identification or type labels. This specimen is quite similar to the type specimens of *Ch. aeneolucens* except its color. It is black and corresponds to the description of var. *melanaspis*. I think, it is probably the type specimen of *melanaspis*. I believe, it represents intrasubspecific color variability of *Ch. aeneolucens* because the different development of metallic tint in the specimens from the same population is typical for *Chrysolina*.

305. *Apterosoma angusticollis* Motschulsky, 1860b was subsequently considered to be a member of the genus *Chrysomela* by Weise (1900, 1916), Jacobson (1901b). Therefore, it became a junior secondary homonym of *Chrysomela angusticollis* Duftschmid, 1825. However, *angusticollis* Motschulsky was not replaced. At present, the replacement is not necessary, because *angusticollis* Motschulsky is included in the genus *Chrysolina*, and *angusticollis* Duftschmid – in the genus *Timarcha* since Weise (1916).

306. *Chrysomela cuprina* was originally described from "Wien" and "Kärnthen" (Duftschmid, 1825). Vienna city represents a separate Bundesland within a Bundesland Lower Austria. Subsequent interpretations of the name *cuprina* were different: as aberration of *Ch. geminata*, or valid species, or senior synonym of *Ch. quadrigemina* (e.g., Weise, 1916; Bechyné, 1949b; Brovdij, 1977). I designate a neotype of *Ch. cuprina* to confirm the recent interpretation (Dahlgren, 1984; Kippenberg, Döberl, 1994; Warchałowski, 1993, 2003; Bieńkowski, 2004; Lopatin, Nesterova, 2005; Kippenberg, 2010) of this name. Neotype (*Hypericia* figure 46) is a male collected in Bundesland Lower Austria, Vöslau city, not far from Vienna city. It corresponds to the original description (except the color), and to the recent interpretation of this name (see above). According to Duftschmid (1825), dorsum is coppery-bronze, but neotype is blue with violet tint on elytra. Blue and coppery-bronze color variations both are common in this species, however all available specimens from Lower Austria are blue. Neotype has lateral sides of pronotum evenly rounded. Elytron with 5^{th} puncture row consists of 20 punctures, 9^{th} – 24 punctures. Elytral rows distinctly paired: 2nd with 3rd, 4^{th} with 5^{th}, 6^{th} with 7^{th}, 8^{th} with 9^{th} Last abdominal sternite with large deep impression and with deeper narrow furrow along apical margin. Apical plate of flagellum narrowed at the end. Length 6.4 mm.

307. *Chrysomela marginalis* was originally described as a species close to *Ch. sanguinolenta* and differing in dorsum more shining, pronotal disc smooth, elytral punctures smaller, shallower, and more numerous (Duftschmid, 1825). Subsequent interpretations of the name *marginalis* were different: valid species or synonym of *Ch. sanguinolenta* (e.g., Suffrian, 1851; Weise, 1916; Warchałowski, 1993, 2003). I designate a neotype to confirm the recent interpretation (Warchałowski, 1993, 2003; Kippenberg, 2010) of this name. Neotype (*Stichoptera* figure 57) is a male collected in Austria, Purbach envir., at Neusiedlersee. It corresponds to the original description of *marginalis* and has pronotal disc covered with sparse and very fine punctures, elytral punctures moderately large. It represents a case of intraspecific variability of *Ch. sanguinolenta*. Length 7.0 mm.

308. The name *Chrysolina schaefferi* was suggested (Brown, 1962) as a substitute name for primary junior homonym *Chrysomela cyanea* Schaeffer nec Linnaeus. However, I could not find the current status of the name *Chrysomela cyanea* Linnaeus. It was originally described from "America" in a species group with "corpore cylindrico" (Linnaeus, 1767). The neighboring species included by the author in this group belong presently to subfamilies Clytrinae and Cryptocephalinae. I could not find the name *cyanea* Linnaeus (as well as *cyaneum, cyaneus*) either in worldwide catalogue of Megascelinae, Megalopodinae, Clytrinae, Cryptocephalinae, Chlamisinae, Lamprosomatinae (Clavareau, 1913), Chrysomelinae (Weise, 1916) or in catalogue of leaf beetles of N America (Riley, et al., 2003). Type specimens of *Chrysomela cyanea* absent in the Linnean collection (LSL).

310. "Fauna Germanica", Bd. 4 by E. Reitter (Reitter, E., 1913a), including all new taxa suggested in this work, was published not in 1912, as it is mentioned on the title page of the book, but in late 1913, as Bickhardt (1914) established.

311. *Ch. aegyptiaca* (under the name *Ch. palmyrensis*) was recorded from S Turkey (Gaziantep) by Gruev, Tomov (1979).

312. *Ch. bourdonnei* was originally described as a species close to *Ch. sanguinolenta*. I examined the type specimens of the former and believe it to be a subspecies of *Ch. latecincta* because of the ratio of antennomeres 7–9: each of them is as long as wide (*Stichoptera* figures 30–32).

313. *Ch. laotiana* is originally described based on the 2 males and 1 female from Laos (Sprecher-Uebersax, Daccordi, 2016). According to the original description, *Ch. laotiana* is similar to *Ch. baronii* inhabiting N-E India (Sikkim – type locality, and West Bengal), and *Ch. baronii* differs from *Ch. laotiana* in "the larger and more flattened prothorax and the denser punctures at the sides of the prothorax as well by the shape of the median lobe of the aedeagus". I studied paratypes of both, *Ch. baronii* and *Ch. laotiana*, together with additional specimens from Sikkim, and think that the differences of these taxa are within individual variability (*Pierryvettia* figures 33, 55–57).

314. I examined syntypes of both, *Chrysolina femoralis bargusiana* and *Ch. femoralis pernitescens*. Both taxa are described from Pyrenees. The author, Bechyné (1952a) compared subspecies *pernitescens* with *vicinitatis* (in fact, it is a valid subspecies of *Ch. affinis*) and *balanyensis* (unknown to me). Concerning subspecies *pernitescens*, Bechyné (1952a) wrote: "... die mikroskopische Punktierung der Flügeldeckenintervalle ist fast ganz erloschen". However, syntype (male) being at my disposal has distinct, dense elytral tertiary punctures. In my opinion, *bargusiana* and *pernitescens* represent the same taxon.

One male type specimen of *pernitescens* is labeled as "holotype", another male – as "paratype", and female – as "allotype". But holotype was not designated in the original publication (Bechyné, 1952a). Therefore, they are syntypes.

I also studied syntype, male of *Ch. femoralis ootypa* (labelled as "holotype") and syntype, male of *Ch. femoralis parumnitens* (labelled as "paratype") and found them to be morphologically identical with *Ch. femoralis bargusiana* and represent the same taxon. Because of holotypes of *Ch. femoralis ootypa* and *Ch. femoralis parumnitens* were not designated in the original publication (Bechyné, 1952a), the type specimens are syntypes.

315. Type locality of *Ch. songpana* is mentioned in the original description as follows: "China, Sichuan, NE Danba, Guanyuochang, 3556–3792 m, 11 VIII 2004, Belousov, Kabak" (Lopatin, 2007). It is incorrect. Original type labels supplied with the holotype is quite different: "CH, N Sichuan, S Songpan, ESE Zhenjiangguan 32˚17′54″N / 103˚47′46″E 32˚17′58″N / 103˚47′55″E 4100–4185m, 17.07.2005 Belousov & Kabak" (ZIN).

316. I studied paratypes of *Ch. sarroensis* (males and females) from Morocco (*Chalcoidea* figure 9), additional male and female of *Ch. vagecincta vagecincta* from Algeria, and paratype *Ch. vagecincta obscuriventris* (female) from Morocco. All these specimens are similar externally. Besides that, aedeagus of paratype *Ch. sarroensis* is similar with that in *Ch. vagecincta vagecincta* from Algeria and figure of aedeagus of *Ch. vagecincta obscuriventris* in Codina Padilla (1960), but very different from the figure in the original description (Kocher, 1958) of *Ch. sarroensis*. I think, the figure of aedeagus *Ch. sarroensis* by (Kocher, 1958) (aedeagus with apical opening not covered

by lobe, flagellum broad) is sketchy. In fact, aedeagus of paratype *Ch. sarroensis* has apical opening almost covered by lobe, and flagellum narrow as in *Ch. vagecincta*. Therefore, I think that *sarroensis* and *obscuriventris* are synonyms. I have not sufficient material to study taxonomic rank of the subspecies within *Ch. vagecincta*.

317. Taxon *ambiguum* was originally described (Chen, 1936c) based on the single female as a member of the genus *Ambrostoma* and subgenus *Parambrostoma* from "? Korea". It was subsequently stated (Medvedev, Sprecher-Uebersax, 1999a), that the type locality is noted incorrectly; this species occurs in Nepal and N India only. Then, I examined a specimen (female) from Nepal which wholly corresponds to the original description of *ambiguum* (including "the margined metasternal process" mentioned by Chen (1936c)) and transferred (Bienkowski, 2007) *Ambrostoma* (*Parambrostoma*) *ambiguum* to the genus *Chrysolina* (as *Ch. ambigua*) because it shares such features of *Chrysolina* as metasternum entirely marginated anteriorly and elytral epipleura ciliate apically only. Ge, et al. (2012) prepared a cladistic analysis and transferred *Ch. ambigua* back to *Parambrostoma* based on "phylogenetic results" (in Table 1, the taxon *ambiguum* is erroneously included by Ge, et al., 2012 in the genus *Ambrostoma*). Ge, et al. (2012) explained this decision as follows: "An enforced clade *Chrysolina mirabilis* + *Parambrostoma ambiguum* requires seven additional steps. The poor resolution of the strict consensus tree reflects a high level of homoplasy as it is typical for morphology-based analysis on the species level". Ge, et al. (2012) mentioned *Ch. mirabilis* here, because it is the single *Chrysolina* member used by them as outgroup in the cladistic analysis of *Ambrostoma* and *Parambrostoma*. However, *Ch. mirabilis* is taxonomically far from *ambigua*. Comparing such morphologically different species of the genus *Chrysolina*, as *mirabilis* and *ambigua*, Ge, et al. (2012) came to an erroneous conclusion.

The inclusion of *ambigua* in the genus *Parambrostoma* entails the expansion of the diagnosis of the last genus (metasternum becomes marginated or immarginated anteriorly). This is very undesirable for such a small genus as *Parambrostoma*, including only 7 species, and makes it indistinguishable from *Chrysolina*. It is more logical to present *ambigua* as a member of a large and very diverse genus *Chrysolina*, from which it differs only in the presence of transverse depression in the outer part of the elytra behind the humeral tubercle. I believe that the character of the presence of such transverse impression of the elytra (developed to varying degrees in *Parambrostoma*) has less taxonomical weight than the presence of a clear edging of the metasternum. The color of the upper side of *ambigua* (metallic green with purple stripes) is typical for a number of *Chrysolina* species from China.

318. Kocher (1958) described four "variétés", which differ in the coloration of body and elytral punctures. Meanwhile, the author (Kocher, 1958) noted: "<...> espèce est très polymorphe: on trouve parfois, dans une même série, des individus présentant des différences notables quant à la couleur, la ponctuation élytrale, etc. Il ne paraît donc guère possible de distinguer des sous-espèces bien caractérisées au double point de vue morphologique et géographique, comme on l'a fait pour *carnifex*; <...>" This permit me to consider the above mentioned "variétés" names as intrasubspecies ones, according to ICZN (1999): 45.6.1 and Example 3.

319. The name *gibba* was originally proposed by Suffrian (1851) as a subtitle inside the description of *Ch. purpurascens* (p. 25) as follows: "*β.* bräunlich erzfarbig, der *Chr. crassimargo* und der Normalform der *Chr. marcasitica* ähnlich. Diese Form findet sich im Mus. Berol. als *Chr. globata Dahl!* und in *Germar's* Sammlung als *Chr. gibba Dahl!*, sie ist übrigens mit der Stammform durch zahlreiche Uebergänge verbunden, und zeigt keine wesentlichen Abweichungen; Naht und Saum

des Schildches fallen bei ihr ins Purpurröthliche". The name *gibba*, originally proposed by E. Suffrian as a junior synonym, is unavailable (ICZN, 1999, 11.6).

320. Both "varieties" *nigrocuprea* and *taupini* were originally described as rare cases of coloration in the series of *Ch. graminis* (among more than 800 specimens) from Montargis in 1923. Therefore, these varieties are unavailable (ICZN, 1999, 45.6.4). Later, the same author (Mallet, 1933) considered *taupini* and *nigrocuprea* as the aberrations.

321. *Chrysomela graminis* var. *rugulosa* was originally described as a rare variation of the elytra relief: punctures very large, wrinkled. There were only two such specimens among the specimens of *Ch. graminis* from Montargis. Therefore, this variety is unavailable (ICZN, 1999, 45.6.4). Despite this fact, Kippenberg (2010) included this name in the synonymy of *Ch. graminis graminis*.

322. *Chrysomela ruandana* var. *pauperata*, according to the original description, was presented by the several specimens with the different coloration, collected from the same localities, by the same collectors and for the same periods of time, as typical *ruandana*. Therefore, this variety is unavailable (ICZN, 1999, 45.6.4).

323. Rossi (1792) in the original description of *Chrysomela gemellata* referred to Degeer: "Ent. Paris. 110. 22.", but described another species, conspecific with *quadrigemina*. Therefore, *gemellata* Rossi is an unavailable name due to a misidentification (ICZN, 1999, 49). The specimens, identified by Rossi (1792) as *gemellata*, absents in P. Rossi collection in MNHUB (Dahlgren, 1984).

324. Germar (1813) named this species as: "*bicolor* Fabricius, 1775: 95". If Germar (1813) studied another species, but not a *bicolor* Fabricius, then *bicolor* Germar is an unavailable name.

325. *Chrysomela sanguinea* Brullé, 1838 was described as follows: "*Chrysomela sanguinea*. Fab. Espèce très-répandue dans dans toutes les parties de l'Europe, mais qui présente des variétés locales; <... followed by the charaters of the specimens from Canary Isls. ...>". "Ce seul caractère est insuffisant pour constituer une espèce, parce qu'on ne peut en pendre une idée exacte qu'en comparant deux insectes des deux localités différentes". All this allows me to conclude, that *sanguinea* Brullé is an incorrect subsequent spelling (ICZN, 1999, 33.3) of the name *sanguinolenta* Linnaeus.

326. Germar (1824) named the species as: "*Chrysomela hemichlora* Gebleri". From the Germar's description and type locality it is clear to me that E. Germar had in mind *haemochlora* Gebler. Therefore, the name, published by Germar (1824), is either unjustified emendation, or incorrect subsequent spelling. According to ICZN (1999, 33.5), this name should be considered as incorrect subsequent spelling. Therefore, it is an unavailable name.

327. Demaison (1896) noted that the coloration is varying in *Ch. bruneli* and offered the names for two such color variations, namely, var. *concolor* and var. *nebulosa*, without the special type localities. These names are unavailable (ICZN, 1999, 45.6.4).

328. Kippenberg (2010) in the synonymy of *Chrysolina variolosa* mentioned the names: *Chrysomela eschleri* Suffrian, 1851: 64 and *Chrysomela melanosticta* Suffrian, 1851: 64. Suffrian

(1851) in the end of the description of *Chrysomela sparshalli* writes (p. 64) the following: "in den Sammlungen gewöhnlich unter den traditionellen Benennungen Chr. Escheri *Lasserre*, melanostigma oder melanosticta *Kollar*, sicula *Dej*. bekannt." Therefore, Suffrian (1851) does not consider the names *Escheri* and *melanosticta* as the valid ones. These names are unavailable, because they were originally published in the synonymy of the available name and were not considered as the names of any taxa or as senior homonyms until 1961 (ICZN, 1999, 11.6.).

329. Jacobson (1896) on the base of the specimens from Balashov Distr. of the Saratov reg. (S-E European Russia) published a description of "*Chrysomela Besseri*", from which I can to consider that G. Jacobson had another species but not *Ch. besseri* Krynicki in modern sense (Bieńkowski, 2007a): elytra with rufous band laterally and apically only; last maxillary palpomere very broad, much broader than penultimate in both sexes (in male this palpomere is broader than in female), broadly truncate apically; pronotal lateral callus is separated basally by deep furrow, covered by punctures. Therefore, *Chrysomela Besseri* Jacobson – is a misidentification and therefore unavailable name. What species actually had G. Jacobson, it is difficult to establish without the studying the material. So far, I have not been able to find these specimens in the collection by Jacobson in ZIN. Kippenberg (2010) includes this name in "genus *Chrysolina* nomina dubia". Really, broadened last palpomere permits us to separate this species from the representatives of the subgenus *Chalcoidea* (*Ch. marginata, Ch. carnifex, Ch. songarica, Ch. besseri*). The members of the subgenera *Zeugotaenia* (only *Ch. limbata* inhabits Saratov reg.) and *Stichoptera* (*Ch. sanguinolenta* and *Ch. gypsophilae* live in Saratov reg.) have such palpi. This "unknown" species, *Ch.besseri:* Jacobson, differs from the subgenus *Zeugotaenia* by the absence of rufous band at the elytra base. It differs from the subgenus *Stichoptera* by the presence of 9 entire rows and 1 abbreviated one of large punctures (some confused) at elytra. Jacobson (1896) in the same list mentioned several species, evidently different from this "unknown" species: *Ch.* (*Zeugotaenia*) *limbata, Ch.* (*Stichoptera*) *gypsophilae, Ch.* (*Chalcoidea*) *marginata, Ch.* (*Chalcoidea*) *circumducta* Suffr. (=*cinctipennis* Harold = *besseri* Kryn.).

330.The original description of *Chrysomela obscurata* Duftschmid, 1825refers to the description of *Chrysomela obscurata* Fabricius. It is difficult for us to decide, if it was the same, or another species. If it was another species, then *Chrysomela obscurata* Duftschmid is an unavailable name because of the misidentification.

331. The name *Chrysomela menthastri* ab. *cyaneo-nigra* Jolivet, 1943 was erroneously cited by Kippenberg (2010) twice, as "*cyanonigra*" and "*yanonigra*" (p. 417), and by Petitpierre (2019) as "*Chrysomela yanonigra*", all names as junior synonyms of *Chrysolina herbacea herbacea*. The name *cyaneo-nigra* is unavailable (intrasubspecific name), and the names *cyanonigra* and *yanonigra* are unavailable (incorrect subsequent spelling (ICZN, 1999, 33.3), published by Kippenberg (2010) and Petitpierre (2019) as junior synonyms (ICZN, 1999, 11.6)).

332. Kippenberg (2010) cited *Ch. minckwitzi pentheri* (with incorrect page number 94) as a junior synonym of *Ch. atrovirens minckwitzi*. In fact, G. Müller (1948) mentioned one specimen from Montenegro supplied with original label "*Minckwitzi Pentheri* Apf." (this taxon was not described by V. Apfelbeck, and this name is *in litteris*). Müller (1948) wrote, that this specimen differs from the type of *Ch. minckwitzi* in bronze coloration only and does not deserve a separate name. Therefore, the name *pentheri* Kippenberg (2010) is a *nomen nudum*.

333. *Chrysolina* (*Camerounia*) *semifulva* Bechyné, 1954a is an incorrect subsequent spelling of the name *Polysticta semirufa* Fairmaire, 1894. Bechyné (1954a) used this name as "*Chrysolina* (*Camerounia*) *semifulva* Fairmaire". He has not mentioned the original spelling, but indicated the diagnostical characters, which refer to the same taxon as *semirufa* Fairmaire. Therefore, *semifulva* Bechyné is an unavailable name (ICZN, 1999, 33.3).

334. Breit (1919) recorded *Ch. planicollis* from Syria, and I found in NMB one syntype, female labelled "Syrien". However, all modern well-labeled materials are known only from the NE Turkey. Therefore, I doubt the reliability of the indication of this species from Syria.

335. Holotype of *Chrysolina elysia* Bechyné, 1954 was not designated in the original publication. Therefore, the type specimens are syntypes. Having examined two syntypes in NMB, I found them to belong to two separate species. One specimen, female (Nguela, Usambara A. Heyne, Berlin – Wilm. / TIPE *Chrysolina elysia* m. J. Bechyne det., 1953) corresponds to the original description. It has elytral spots pale yellow, slightly convex, covered by hardly visible, very fine punctures arranged in rows. Another specimen (Tanganjika Kilimandjaro, Marangu, 1500 m, 18.X.1952 leg. Lindemann und Pavlitzki. Zoolog. Staatsslg. / P-TIPE *Chrysolina elysia* m. J. Bechyne det., 1954) has elytral spots covered by punctures as large as those on the rest surface of elytron, and 4th tarsomere without angulate projections ventrally. It belongs to *Ch. clarkii*. I designate here the first specimen (Nguela, Usambara A. Heyne, Berlin – Wilm. / TIPE *Chrysolina elysia* m. J. Bechyne det., 1953) as a lectotype of *Ch. elysia* for the stability of the nomenclature.

336. One of two specimens of *Ch. centralasiae* in NMB, labelled as "Mongolia, Ostgobi aimak 20 km S. v. Sainschand 950 m Exp. Dr. Z. Kaszab, 1963 / Nr. 42 27.VI.63 / PARATYPE / *Chrys. aeruginosa centralasiae* nov. det. I. Lopatin, 19... " is not a paratype. After original description, Lopatin (1970a), all type specimens were collected in 1967, but not 1963, in two aimaks, Middle Gobi aimak and South Gobi aimak, but not East Gobi aimak.

337. *Chrysomela crassicornis breiti* was considered before (Kippenberg, 2010; Lopatin, 2010; Bienkowski, 2019) as a junior synonym of *Ch. sanguinolenta* (Linnaeus, 1758). Having examined holotype of *breiti*, I found that it has yellow elytral stripe occupying 2.5 lateral intervals, lateral impression at pronotal base is more shallow than in *Ch. sanguinolenta*, elytral puncturation is stronger than in *Ch. sanguinolenta*, antennomeres 7–9 each as long as broad (*Stichoptera* figure 61), and aedeagus (*Stichoptera* figure 60) is similar with that in *Ch. latecincta latecincta*. On the base of these characters, I came to conclusion that *breiti* is conspecifis with *Ch. latecincta latecincta* but not with *Ch. sanguinoletna*. I think, that the type label of *breiti*: "Turkestan, Prov. Syr Darja" is mistake.

338. Type locality of *Ch. nagaja*, "Pakistan, Jhikagali, 2100 m", mentioned in the original description (Daccordi, 1982a), is incorrect (M. Daccordi, personal communication). Correct type label: "O. Nepal 1979 Bhakta B. Ch. / Lamjura 28.VI. 3200 m, Khumbu" is supplied to type specimens in NMB. Figures (*Ch.* (*nagaja*) species group figures 1–5) probably belongs to another, undescribed species.

339. The article by Warchałowski (1991) (with the new subgeneric name *Fastuolina* to replace subgeneric name *Dlochrysa* for *Ch. fastuosa*) contains some errors (for example, in the Abstract, *Dlochrysa* Motschulsky is mentioned as an objective homonym of *Oreina* Chevrolat). However, from the contents of the article by Warchałowski (1991), including the title “Eine

nomenklatorische Anderung innerhalb der Gattung *Chrysolina* Motschulsky", it becomes clear that the name *Fastuolina* was proposed by him for the subgenus within the genus *Chrysolina*, not within the genus *Oreina*, with a type species *fastuosa*: "Für die bisherige Untergattung *Dlochrysa* schlage ich den Namen *Fastuolina* nom. nov. und die species typica *Coccinella fastuosa* Scopoli 1763: 74 (monotypisch) vor."

In the Abstract, Warchałowski (1991) writes that the new name *Fastuolina* is offered for *Dlochrysa* Motschulsky. It is a mistake. However, from the main text of the article (Warchałowski, 1991), we can see that the author clearly understands *Dlochrysa* Motschulsky as a synonym of *Oreina* (based on the same type species *speciosa* sensu Fabricius = *speciosa* Linnaeus): "Demnach ist der Name *Dlochrysa* Motschulsky zu einem obiektiven Synonym des Namens *Oreina* Chevrolat geworden und kann nicht zur Benennung einer *Chrysolina*-Untergattung benutz werden".

Warchałowski (1991) does not explicitly indicate that he offers a new name for *Dlochrysa* Bechyné, but he is not obliged to do so (ICZN, 1999, 51.1). However, there can be no error, since we know the only subgeneric name *Dlochrysa* within the genus *Chrysolina* – it is *Dlochrysa* Bechyné (Bechyné, 1950a, Warchałowski, 1991, Bieńkowski, 2001, Kippenberg, 2010). The name *Dlochrysa* Bechyné is unavailable because of incorrect identification of *Dlochrysa* Motschulsky. After ICZN (1999, 23.3.5), if the name of the taxon is unavailable or invalid, it must be replaced by a senior available synonym or (if it absents) – with a new replacement name. Threfore, *Fastuolina* is available name for the subgenus with the type species *fastuosa* Scopoli. Type species for *Dlochrysa* Bechyné is *fastuosa* Scopoli, by monotypy (ICZN, 1999, 68.3). This species becomes a type species for *Fastuolina* (ICZN, 1999, 67.8.).

Recently Petitpierre, Alonso-Zarazaga in Petitpierre (2019) offered a new subgeneric name *Fasta* within the genus *Chrysolina*, with the type species *Coccinella fastuosa*. I consider it to be a junior synonym of *Fastuolina*.

340. *Chrysomela bicolor* Fabricius, 1775 is a primary junior homonym of *Chrysomela bicolor* Linnaeus, 1767. Presently, both names are in use, the former in the genus *Chrysolina*, and the latter in the genus *Alagoasa* Bechyné, 1955. These names apply to taxa not considered congeneric after 1899 because American species *Ch. bicolor* Linnaeus, 1767 was transferred to the genus *Galeruca* by Fabricius (1775) (cited by Heikertinger, Csiki, 1940), later to *Altica* by Olivier (1789) (cited by Heikertinger, Csiki, 1940), then to *Oedionychus* by Heikertinger, Csiki (1940). Finally, all American species of *Oedionychus* were transferred by Bechyné (1955) to new genus *Alagoasa*. This case should be referred to the International Commission on Zoological Nomenclature for a ruling under the plenary power and meanwhile prevailing usage of both names is to be maintained (ICZN, 1999, 23.9.5).

341. *Chrysomela lucida* Olivier, 1807 is a primary junior homonym of *Chrysomela lucida* Tigny, 1802. As I know, the name, *lucida* Tigny, 1802 was not used as a valid name after 1899. This name is not mentioned in catalogues by Gemminger, Harold (1874), Weise (1916), Winkler (1930, Kippenberg (2010) (ICZN, 1999, 23.9.1.1 is satisfied). On the other hand, the name *lucida* Olivier, 1807 is currently used as a valid one in the genus *Chrysolina* in 25 publications by more than 10 authors since 1970 as follows: Bahillo de la Puebla, Román (2009), Baselga, Novoa (1999), Baselga, Novoa (2006), Bieńkowski (2001), Bieńkowski (2008), Bontems (1988), Bourdonné, Doguet (1991), Ferreira (2011), García-Ocejo et al. (1992), Garin et al. (1999), Gomez-Zurita et al. (1999), Jurado-Rivera, Petitpierre (2015), Kippenberg (2010), Petitpierre (1981), Petitpierre (2019), Petitpierre et al. (1988), Petitpierre et al. (2020), Petitpierre, Segarra (1985), Şen, Gök (2014), Ugarte san Vicente (2005), Vela, Bastazo (1999), Warchałowski (1993), Warchałowski

(2003), Warchałowski (2010), Winkelman, Debreuil (2008) (ICZN, 1999, 23.9.1.2 is satisfied). Therefore, *lucida* Olivier, 1807 is a nomen protectum.

Chrysomela lucida Tigny, 1802, after original description, is large leaf-beetle (slightly less than 9 mm long), with antennae, head and pronotum black, punctate, elytra red, shining, covered by puncture rows, body underside and legs bluish-black; it is found in France, environs of Paris, and Germany, on vine.

It looks like *Ch. grossa* (Fabricius, 1792) in which elytral puncturation is mostly irregular, but several rows can be traced among confuse punctures. However, *Ch. grossa* has head and pronotum metallic blue, bluish green, green, or golden green in all known specimens from S. France and Italy. Only subspecies *Ch. grossa chloromaura* (Olivier, 1807) has head and pronotum black. Besides that, *Ch. grossa* is not found either in the environs of Paris, or in Germany. Therefore, I think *Chrysomela lucida* Tigny to be a nomen oblitum.

342. The subgeneric name *Chrysolina* (*Sulcicollis* Sahlberg, 1913) was considered by Bieńkowski, (2001) as a subjective senior synonym of *Ch.* (*Minckia* Strand, 1935). It was followed by Kippenberg (2010) and Warchałowski (2003, 2010). Petitpierre (2019) used the name *Ch.* (*Minckia*) as a valid for the subgenus in question and paid attention on homonymy *Sulcicollis* Sahlberg, 1913 (junior homonym) with "*Sulcicollis*" Klug, 1833. Klug (1833) published a new name as follows: "*Haltica* (*sulcicollis*) *olivacea* n.sp.". In this case, the intercalar name enclosed in parentheses cannot have subgeneric status as it is printed with a lowercase letter (ICZN, 1999, 4, 6.1). Therefore, it cannot be a homonym of *Sulcicollis* Sahlberg. Probably, Klug (1833) designated a group of species in this way.

343. Subspecies *Ch. fuliginosa espanoli* was described by an unspecified number of specimens from the south of Catalonia. I examined two specimens from Catalonia which differ from the other subspecies by the characters mentioned in my key (see Review of the subgenera, subgenus Allochrysolina), namely, paratype (female) and additional specimen (male).

Petitpierre (2019) writes that the characters indicated by Bechyné (1950) to define the subspecies *espanoli* are not observed in all available specimens from Catalonia, and therefore, these characters cannot be used to identify a subspecies as they are subject to individual variability.

I believe this question requires further study.

344. Wang et al., (2020) provided a new replacement name *Ch. yurimikhailovi* for *Ch. mikhailovi* Lopatin, 2011 because of homonymy with *Ch. mikhailovi* Ge et Daccordi, 2011 (see also Comment 143). However, it is not necessary because *Ch. mikhailovi* Lopatin, 2011 is a junior synonym of *Ch. pudica* L. Medvedev, 1970. Only the names used for any taxa should be replaced due to invalidation (ICZN, 1999, 23.3.5).

345. Özdikmen, et al. (2020) included a new taxon *pinarbasiense* in *Ch. sanguineocincta* at subspecific rank. They considered *sanguineocincta* to be separate species with two before described subspecies: *sanguineocincta* s.str. and *sanguineocincta bodemeyeri*, but not a subspecies *Ch. marginata sanguineocincta*. Özdikmen, et al. (2020) paid attention that *pinarbasiense* differs from both, *sanguineocincta* and *bodemeyeri*, in smaller body and quite different aedeagus structure. In my opinion, *pinarbasiense* belongs to *Ch. marginata*, probably, at subspecific rank. *Chrysolina marginata* is characterized by great variability in the proportions of the apical process of the aedeagus. To decide the exact taxonomic position of *pinarbasiense*, it is necessary to study the type specimens.

346. Until now, *Chrysolina levi* was known only from the Taman Penins.(Krasnodar Krai). Long before the original description, one female was collected in Stavropol Krai: 40 km E from Divnoe Vill., Manych river, near Khara-Zukha river mouth, 24.5.1950, O.L. Kryzhanovsky leg. (OC). Recently, the species was found in Western Siberia (Omsk reg.: Cherlak distr., 7 km NNW from Jartargul Vill.) (Mikhailov, 2020).

347. Bieńkowski (2019) recorded *Chrysolina mactata* from France based on the single specimen labelled "Gallia" (LC). After Dr. E. Petitpierre, personal communication, this species does not live in France, it extends from northern Portugal, to Galicia and Asturias in Spain, but is not found in Cantabria and the Basc country in Spain, and not found in France. This species is also absent from the review of Chrysomelinae of France (Winkelman, Debreuil, 2008). Possibly the specimen from "Gallia" was mislabeled.

348. Bieńkowski (2019) recorded *Chrysolina marginata bodemeyeri* from Majorca Island based on the two specimens (male and female) labeled "Malorca". According to Dr. E. Petitpierre, a recognized connoisseur of the fauna of the Balearic Islands, personal communication, this subspecies does not live in Majorca where the species *Ch. marginata* is not present. Possibly the specimens from "Malorca" were mislabeled.

349. Although Winkelman, Debreuil (2008) considered *aveyronensis* as a subspecies: *Ch. femoralis aveyronensis*, I take a different point of view. I consider it as a separate species. The specimen at my disposal from Spain (Catalonia, Barcelona Prov., Montseny, 23.9.1989, H. Silfverberg leg.: 1 male, ZMUH) is compared well with the characters of the type specimens of *aveyronensis* (NMP), examined by me.

350. Bieńkowski (2019) noted, with a doubt, *Chrysolina stachydis* from S. Spain. Recent data do not confirm the finding of this species in Spain (Petitpierre, 2019).

351. When we (Bieńkowski, Orlova-Bienkowskaja, 2011) revised *Chrysolina limbata*, we have not the specimens from the Iberian Peninsula west of the Pyrenees. Petitpierre (2019) found the specimens from Spain (Huesca, Soria, Burgos, Leon, Palencia), partly similar in color pattern to the subspecies *Ch. limbata discipennis*. Spanish specimens are black, slightly shining, with broad basal and lateral elytral stripes reddish brown. On this basis, Petitpierre (2019) concluded that *discipennis* is not a subspecies but an aberration. I disagree with this interpretation. The following arguments should be taken into account: 1) the subspecies *discipennis* is known from a limited area of semi-deserts and deserts of S.-E. European Russia and W. Kazakhstan, that is, geographically very far from Spain; we studied 152 specimens of *discipennis* from 13 locations; 2) the black color of the elytra is present only in 14% of the *discipennis* specimens, the remaining 86% of the specimens are violet or blue dorsally, that is, the color mostly differs from the Spanish specimens; 3) subspecies *discipennis* is characterized by a sharp predominance of specimens with normally developed hind wings; this feature is unknown for Spanish specimens, although it is of great importance for distinguishing between subspecies of the species in question; 4) in the subspecies *discipennis*, the apical triangle of the aedeagus is very short to medium in length, while in the Spanish specimens the apical triangle is very long (according to figure in Petitpierre, 2019). The taxonomic status of the Spanish form of *Ch. limbata* deserves further study on a large material.

352. *Chrysolina americana* was recently found in the south of European Russia: Crimea (Bieńkowski, Orlova-Bienkowskaja, 2018), and Krasnodar Krai (Sochi) (Kravetz, Sergienko, 2018), and in Cyprus Isl. (Hadjiconstantis, Zoumides, 2021).

353. Mikhailov (2002) synonymyzed the subgenera *Timarchoptera* and *Paraheliostola* based on a comparative morphological study of all representatives of both subgenera. The molecular phylogenetic analysis of their type species, *Ch. haemochlora* and *Ch. soiota*, respectively, does not support this view (Jurado-Rivera, Petitpierre, 2015). Therefore, Petitpierre (2021b) proposed to consider *Paraheliostola* as a valid subgenus.

I remain with the previously proposed point of view on the synonymy of *Timarchoptera* and *Paraheliostola* in view of the following four arguments. 1. In addition to the type species, in order to resolve the question of the taxonomic relations of the two subgenera, the other taxa should be studied. These are *Ch. lomakini* and *Ch. soiota khakassa* in which cytogenetics is unknown. 2. According to Jurado-Rivera, Petitpierre (2015), the Bayesian phylogenetic tree and Maximum likelihood phylogenetic tree show, on the branch closest to *Ch. haemochlora*, two species of the genus *Oreina*, namely *O. ganglbaueri* and *O. speciosa*, and a little further in the same clade also only representatives of the genus *Oreina*, namely *O. cacaliae*, *O. speciosissima*, and *O. fairmairiana*. These taxa of *Oreina* are morphologically very far from *Ch. haemochlora*. This indicates a possible inadequate selection of parameters for phylogenetic reconstruction. 3. The taxonomic conclusion on the separation of the two subgenera should be supported by morphological characters, and not be based only on the results of molecular genetic research. This is in line with the current tradition of taxonomy. 4. Statement: "*Paraheliostola* L. Medvedev (1992) should be *stat. ressur*. as a good new subgenus" (Petitpierre, 2021b) can be interpreted as a nomenclatural act proposed conditionally and therefore inavailable (ICZN, 1999, 15.1).

354. Mikhailov, Reshetnikov (2021) considers *Chrysolina sahlbergiana jacobsoni* Lopatin (= *kuznetzowi* Jacobson) as a valid subspecies, distinguishing the populations of the right (*sahlbergiana* s.str.) and left (subsp. *jacobsoni*) banks of the Yenisei river within the Minusinsk Basin. The difficulty of this interpretation lies in the fact that two specimens from the left bank (+ one more specimen without a geographical label) are insufficient for a correct decision about subspecies rank of the differences, even if the available specimens differ.

355. My colleague from Volgograd city, O.G. Brekhov, kindly presented me three specimens of *Chrysolina latecincta* collected by him in Volgograd reg. (S-E European Russia, Ilovlinsky Distr., Trekhostrovskaya Vill., 4.5.1991: male and female, 2.5.1992: female) (*Stichoptera* figures 63–66). This species is known as boreo-montane in Western Europe. It develops on Linaria supina, L. alpina, and Plantago maritima (Petitpierre, 2019). Besides that, one subspecies, *breiti*, was described from S. Kazakhstan (Franz, 1938). Except for one type specimen, no one has found this species in Kazakhstan. I'm assuming the type specimen was mislabelled (see Com. 337). However, in view of the findings of this species in the Volgograd region, the habitat of *Ch. latecincta* in Kazakhstan may be probable. Specimens from Volgograd reg. can be confused with *Ch. sanguinolenta*, but they are well distinguished by elytral rufous stripe is broader (3–3.5 lateral intervals), projecting along elytral base up to scutellum, lateral impression at pronotal base is more shallow, and pronotal lateral callus is much narrower, elytral puncturation is some stronger than in *Ch. sanguinolenta*, antennomeres 7–9 (male) or 7–8 (females) each as long as broad (*Stichoptera* figure 63), and aedeagus (*Stichoptera* figures 64, 65) is similar with that in *Ch. latecincta*, in

particular, apical denticles (in lateral view) look like an isosceles triangle, and are not bent towards the base of the aedeagus as in *Ch. sanguinolenta*. I do not identify the specimens from Volgograd to subspecies, since there are 10 valid subspecies in Europe, the differences between them are not always clear, and I have only 3 specimens from Volgograd reg. After O.G. Brekhov personal communication, the locality of *Ch. latecincta* is located in the south of the steppe zone, it is a floodplain of the Don river with meadows and sparse trees and chalk mountains approach the floodplain with a steppe landscape. It is difficult to give a zoogeographical explanation for the finding of *Ch. latecincta* in Volgograd reg. It may be a relic or unintentional introduction by humans. On the other hand, perhaps we do not yet know the entire range of this species, if it was confused with *Ch. sanguinolenta* in Siberia.