

Remarks about type specimens of *Cicindela elisae* Motschulsky, 1859 and *Cicindela amurensis* Morawitz, 1862 (Coleoptera: Cicindelidae)

Заметки о типах *Cicindela elisae* Motschulsky, 1859 и *Cicindela amurensis* Morawitz, 1862 (Coleoptera: Cicindelidae)

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KEY WORDS. Cicindelidae, *Cicindela elisae*, *Cicindela amurensis*, lectotypes, paralectotypes.

КЛЮЧЕВЫЕ СЛОВА. Cicindelidae, *Cicindela elisae*, *Cicindela amurensis*, лектотипы, паралектотипы.

ABSTRACT. According to study of the type specimens of *Cicindela elisae* Motschulsky, 1859 and *Cicindela amurensis* Morawitz, 1862 their conspecificity is established and their synonymy is reconfirmed. The lectotypes and paralectotypes of *Cicindela elisae* Motschulsky, 1859 and *Cicindela amurensis* Morawitz, 1862 are designated as well.

Cylindera (Eugrapha) elisae (Motschulsky, 1859) [Horn, Roeshke, 1891; Mandl, 1981; Werner, 1992; Wiesner, 1992, 2020; Puchkov, Matalin, 2003, 2017; Lorenz, 2005; Makarov et al., 2020]. Unfortunately, none of the mentioned above authors has designated the types of these taxa.

РЕЗЮМЕ. По результатам изучения типовых экземпляров *Cicindela elisae* Motschulsky, 1859 и *Cicindela amurensis* Morawitz, 1862 г. установлена их конспецифичность и подтверждена синонимия. Обозначены лектотипы и паралектотипы *Cicindela elisae* Motschulsky, 1859 и *Cicindela amurensis* Morawitz, 1862.

Material and methods

The studied type specimens are deposited in the Zoological Museum of the Moscow State University, Moscow, Russia (ZMMU), in the Zoological Institute of the Russian Academy of Science, St. Petersburg, Russia (ZISP), and in the Moscow State Pedagogical University (MSPU).

The measurements (in mm) were made with an ocular-micrometer mounted on a Leica M165c (Carl Zeiss) stereomicroscope, as follows: TL — total body length without labrum (from anterior margin of clypeus to the elytral apex along the suture), LL — length of labrum with apical teeth (along the midline), LW — width of labrum (in the widest place), PL — length of pronotum (along the midline), PW — width of pronotum (in the widest place), EL — length of elytra (from the base of scutellum along the suture), EW — width of elytra (in the widest place), AL — length of aedeagus (from the base to the apex).

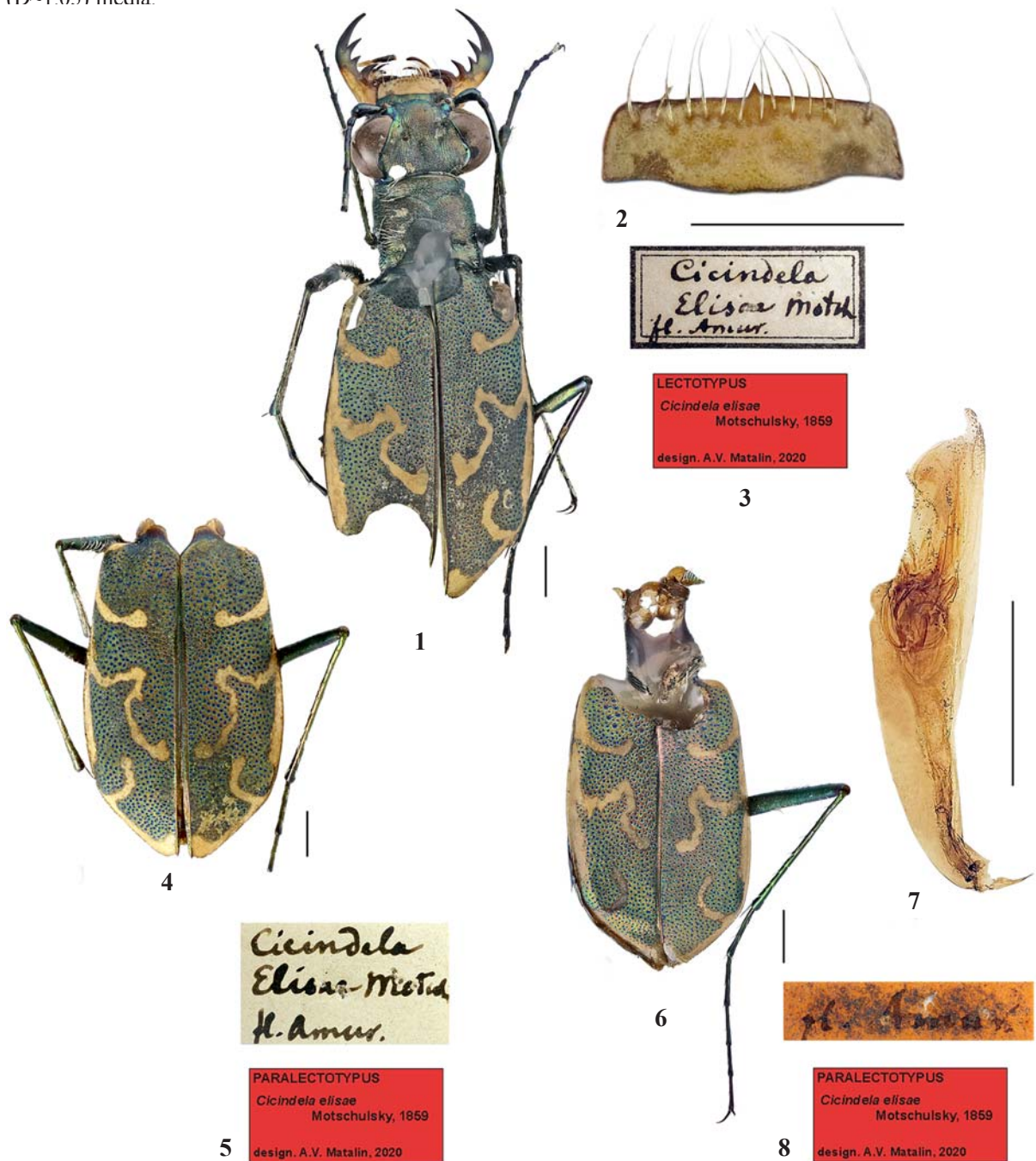
The photographs of the habitus and the details of all studied specimens were taken with a Canon EOS 5D

Motschulsky [1859] described his *Cicindela elisae* from the Amur River, indicating that the type locality ranged from the mouth of Shilka River to Nikolayevsk. Three years later, Morawitz [1862] described his *Cicindela amurensis* from localities near the junctions of Sungari and Amur rivers, as well as of the Ussuri and Amur rivers. Shortly after that, Motschulsky [1864] noted that *C. elisae* had been described once more, under the name of *C. amurensis*, by Morawitz [1862], thus establishing the synonymy of *C. elisae* and *C. amurensis*. Some subsequent researchers shared that point of view [Horn, 1915, 1926; Matsumura, 1928; Lafer, 1978; Kryzhanovskij et al., 1995; Lorenz, 1998], while some others considered both as two subspecies of

Mark III camera with a Canon MP-E 65 mm macro lens. The slides of the male genitalia were photographed with a Canon EOS 6D camera, attached to a Zeiss Axio Scope.A1 microscope. In both cases, the extended focus technique was used. All pictures were processed using Zerene Stacker software. For preparing the slides, the aedeagi of male specimens were consistently kept in 10% KOH (24 h.), 4% acetic acid (5 min.) and cold water (5 min.), and then mounted with Hoyer fluid or Euparal (D~1.05) media.

Results

In the collection of ZMMU three badly damaged specimens of *C. elisae* with the original labels of V. Motschulsky are survived, while in the collection of ZISP four syntypes of *C. amurensis* with the original labels of A. Morawitz were found. A comparison of the type specimens of *C. elisae* (Figs 1–8) and *C. amurensis*



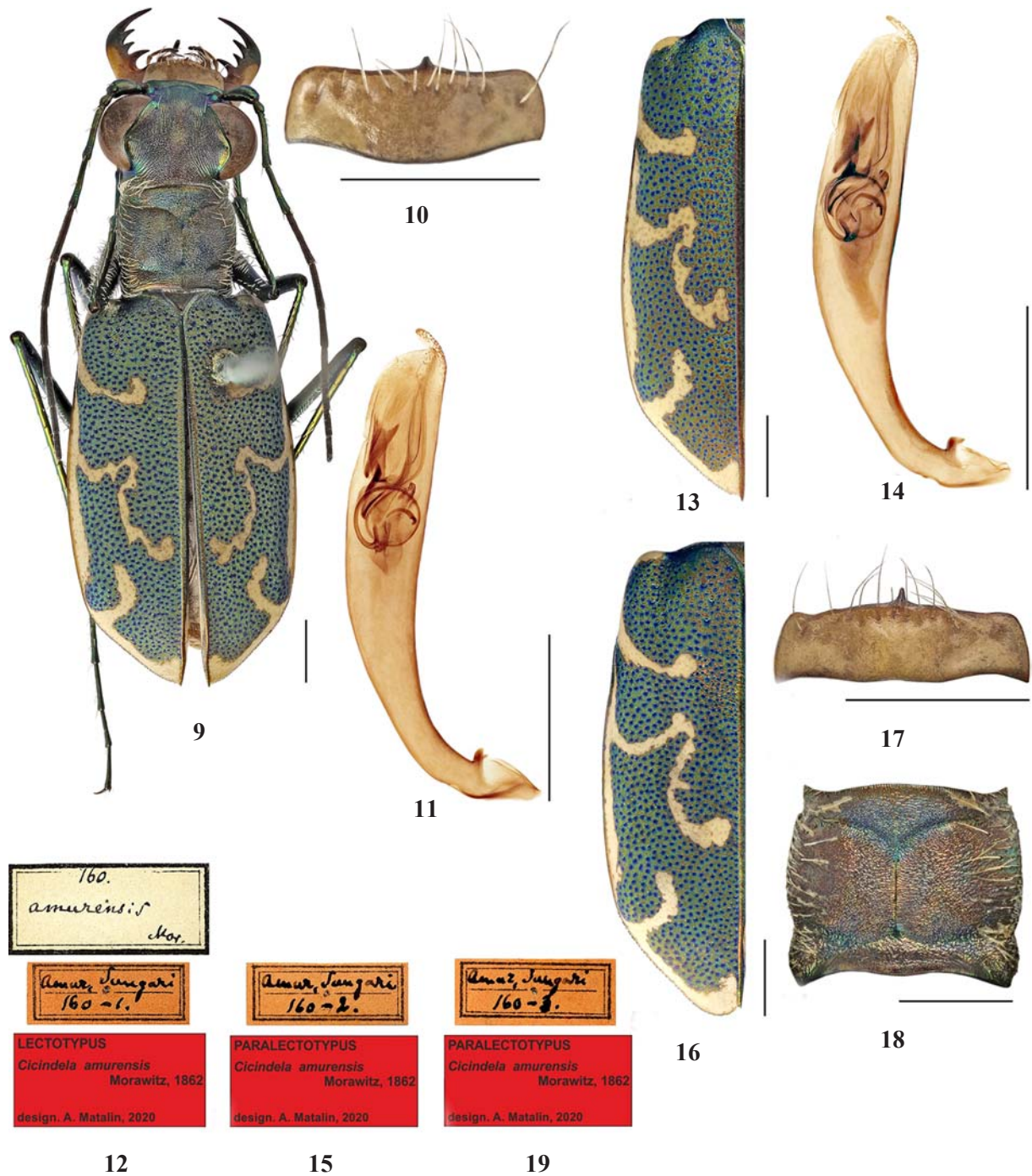
Figs 1–8. Type specimens of *C. elisae*: 1, 4, 6 — habitus; 2 — labrum, 7 — aedeagus; 3, 5, 8 — labels; 1–3 — lectotype; 4–8 — paralectotypes; 1–5 — females; 6–8 — male. Scale bars: 1.0 mm.

Рис. 1–8. Типовые экземпляры *C. elisae*: 1, 4, 6 — габитус; 2 — верхняя губа, 7 — эдеагус; 3, 5, 8 — этикетки; 1–3 — лектотип; 4–8 — паралектотипы; 1–5 — самки; 6–8 — самец. Масштаб: 1,0 мм.

(Figs 9–19) confirms their conspecificity, because the main dimensions (Table; Fig. 20), proportions (Fig. 21), coloration and white elytral pattern as well as the shape of the aedeagus are corresponded to the variability within the same taxon. Thus, the synonymy of *C. elisae* and *C. amurensis* established by Motschulsky

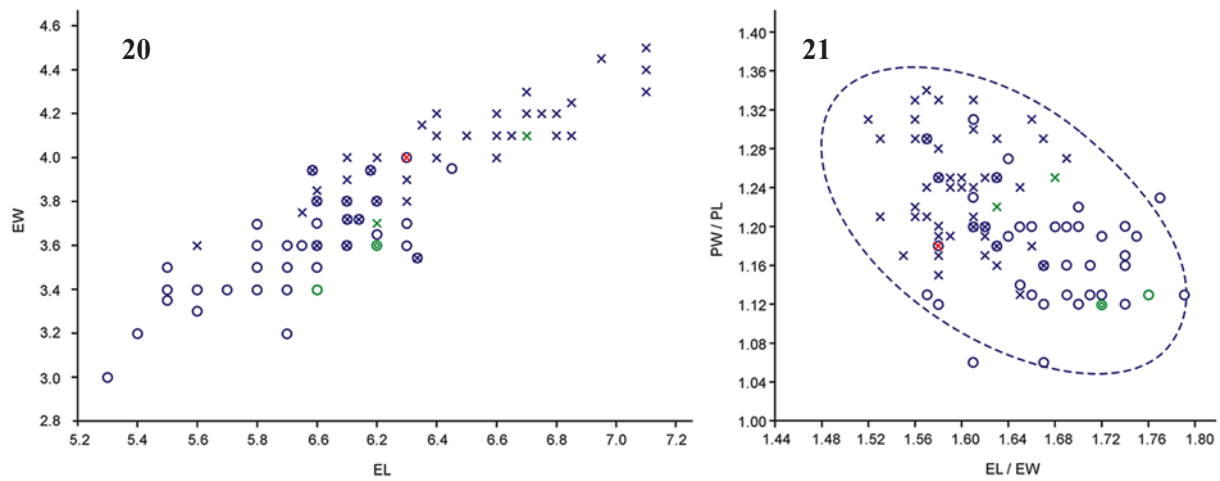
[1864] is reconfirmed.

In order to support the stability of the nomenclature and according to the Articles 72.1, 72.5, 72.9, 74.1 and 74.7 of the ICZN [1999], the lectotypes and paralectotypes of both these taxa are designated below.



Figs 9–19. Type specimens of *C. amurensis*. 9 — habitus; 10, 17 — labrum; 11, 14 — aedeagus; 13, 16 — left elytron; 18 — pronotum; 12, 15, 19 — labels; 9–12 — lectotype; 13–19 — paralectotypes; 9–15 — males; 16–19 — female. Scale bars: 1.0 mm.

Рис. 9–19. Типовые экземпляры *C. amurensis*. 9 — габитус; 10, 17 — верхняя губа; 11, 14 — эдеагус; 13, 16 — левое надкрылье; 18 — переднеспинка; 12, 15, 19 — этикетки; 9–12 — лектотип; 13–19 — паралектотипы; 9–15 — самцы; 16–19 — самка. Масштаб: 1,0 мм.



Figs 20–21. Variation in size and proportion of *Cylindera (Eugrapha) elisae elisae*: 20 — correlation of elytra length and width; 21 — relation of the proportions of pronotum and elytra; circles — males; crosses — females; red cross — lectotype of *C. elisae*; green crosses and simple green circle — paralecotypes of *C. amurensis*; double green circle — lectotype of *C. amurensis*; dotted oval — 95% concentration ellipse.

Рис. 20–21. Изменчивость размеров и пропорций *Cylindera (Eugrapha) elisae elisae*: 20 — соотношение длины и ширины надкрылий; 21 — соотношение пропорций переднеспинки и надкрылий; кружки — самцы; кресты — самки; красный крест — лектотип *C. elisae*; зелёные кресты и простой зелёный кружок — паралектотипы *C. amurensis*; двойной зелёный кружок — лектотип *C. amurensis*; пунктирный овал — 95% область значений.

Cylindera (Eugrapha) elisae elisae (Motschulsky, 1859)

Cicindela elisae Motschulsky, 1859: 487.

= *Cicindela amurensis* Morawitz, 1862: 238.

TYPE MATERIAL. The lectotype of *Cicindela elisae* Motschulsky, 1859 (designated herewith), ♀ (without 10th–11th right and 5th–11th left antennomeres, 4th–5th left fore-tarsomeres, left hind tibia and tarsus, as well as abdomen; with head, prothorax, left femur, elytral base and apex of left elytron damaged by dermestid larvae) — “*Cicindela Elisae* Motsch., fl. Amur” [handwritten white label], “Lectotypus, *Cicindela elisae* Motschulsky, 1859, design. A.V. Matalin, 2020” [printed red label] (ZMMU). Paralecotypes of *Cicindela elisae* Motschulsky, 1859 (designated herewith): ♂ (without head, fore-, middle and left hind legs; with pronotum, base of elytra and apex of right elytron damaged by dermestid larvae) — “fl. Amur” [handwritten red label], “Paralecotypus, *Cicindela elisae* Motschulsky, 1859, design. A.V. Matalin, 2020” [printed red label]; ♀ (without head, prothorax, both fore-, right middle and left hind legs; with 5th–6th abdominal sternites and genitalia damaged by dermestid larvae) — “*Cicindela Elisae* Motsch., fl. Amur” [handwritten white label], “Paralecotypus, *Cicindela elisae* Motschulsky, 1859, design. A.V. Matalin, 2020” [printed red label] (both in ZMMU, Figs 1–8).

The lectotype of *Cicindela amurensis* Morawitz, 1862 (designated herewith): ♂ (without hind right tarsus) — “Amur, Sungari, 160–1” [handwritten pink label], “Lectotypus, *Cicindela amurensis* Morawitz, 1862, design. A.V. Matalin, 2020” [printed red label]

(ZISP); Paralecotypes of *Cicindela amurensis* Morawitz, 1862 (designated herewith): ♂ — “Amur, Sungari, 160–2” [handwritten pink label], “Lectotypus, *Cicindela amurensis* Morawitz, 1862, design. A.V. Matalin, 2020” [printed red label]; ♀ — “Amur, Sungari, 160–3” [handwritten pink label], “Lectotypus, *Cicindela amurensis* Morawitz, 1862, design. A.V. Matalin, 2020” [printed red label]; ♀ (without 10th–11th left antennomeres) — “Ussuri, 160–4” [handwritten pink label], “Lectotypus, *Cicindela amurensis* Morawitz, 1862, design. A.V. Matalin, 2020” [printed red label] (all in ZISP, Figs 9–19).

Discussion

Due to the widespread from the Amur River valley through Mongolia, Korea and China including Sakhalin, Kunashir, Taiwan and different Japanese Islands [Puchkov, Matalin, 2017] to northern Vietnam [Wiesner et al., 2017], *Cylindera (Eugrapha) elisae* (Motschulsky, 1859) is characterized by the high variability. The coloration and the white pattern of elytra are traditionally used for the separation of its local forms. Considering the synonymy of *C. elisae* and *C. amurensis*, nine subspecies are known now: *C. e. formosana* (Minowa, 1932) and *C. e. reductelineata* (W. Horn, 1912) — in

Table. The dimensions of the type specimens of *C. elisae* and *C. amurensis*.

Таблица. Размеры типовых экземпляров *C. elisae* и *C. amurensis*.

Specimens	Sex	TL	LL	LW	PL	PW	EL	EW	AL
<i>C. elisae</i>									
lectotype	♀	9.8	0.5	1.4	1.7	2.0	6.3	4.0	
paralecotype	♀						6.1	3.8	
paralecotype	♂						5.4	3.3	2.6
<i>C. amurensis</i>									
lectotype	♂	9.5	0.5	1.3	1.7	1.9	6.2	3.6	2.8
paralecotype	♂	9.2	0.4	1.3	1.6	1.8	6.0	3.4	2.6
paralecotype	♀	10.1	0.5	1.5	1.8	2.2	6.7	4.1	
paralecotype	♀	9.5	0.4	1.3	1.6	2.0	6.2	3.7	

Taiwan; *C. e. mikurana* (Nakane, 1968) and *C. e. novitia* (Bates, 1883) — in Japan; *C. e. koreanica* (Mandl, 1981) — in South Korea; *C. e. atroelytrata* (Mandl, 1981) — in Chinese province Shaanxi; *C. e. hulunbeirensis* (Li, 1992) — in Chinese Inner Mongolia Autonomous Region; *C. e. kunashirensis* Pütz et Wiesner, 1995 — in Kunashir Island, and nominal subspecies — in Mongolia, Russian Far East (including Sakhalin and Kunashir Islands), North and South Korea, most provinces of China as well as northern Vietnam [Puchkov, Matalin, 2017; Wiesner et al., 2017; Makarov et al., 2020]. However, according to the analysis of the sequences of the 28S rDNA and COI genes some of the insular and mainland subspecies of *C. elisae* actually can be no more than the variations [Sota et al., 2011; Makarov et al., 2020]. The additional researches need to resolve this problem.

Acknowledgements. I am very grateful to A.A. Gusakov (Moscow, Russia) and B.M. Kataev (Saint Petersburg, Russia) who kindly loaned the type specimens for my study, as well as to Sergei Golovatch (Moscow, Russia) for checking the English.

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