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Taxonomical notes on the *Agrilus betuleti* species group with description of two new species (Coleoptera: Buprestidae)

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Abstract

Two new species of the genus *Agrilus* DAHL, 1823 from the *A. betuleti* species group are decribed: *A. fareastensis* sp.n. and *A. voriseki* sp.n.; *A. delphinensis* ABEILLE DE PERRIN is revalidated, *A. supremus* OBENBERGER is elevated to species level and three new synonymies are established (*A. pseudocyaneus* KIESENWETTER = *A. obrucevi* OBENBERGER and *A. bialowiezaensius* GUTOWSKI; *A. delphinensis* = *A. eogenes* OBENBERGER); lectotypes are designated; all examined species are illustrated and a key is provided

Key words: Buprestidae, *Agrilus*, new species, taxonomy, lectotype designations

Introduction

The relationship between *Agrilus pseudocyaneus* KIESENWETTER and *A. delphinensis* ABEILLE DE PERRIN was unclear for a long time. *Agrilus delphinensis* was long regarded a subspecies or synonym of *A. pseudocyaneus* by Buprestid specialists. This was caused by confusion in the type designation and by the insufficient knowledge of *A. pseudocyaneus*. GUTTOWSKI (1993) described *A. bialowiezaensis* adding another species to the group. Examination of the types of *A. pseudocyaneus*, *A. delphinensis* and *A. supremus* OBENBERGER, another closely related species, revealed several taxonomical changes which are presented here.

Furthermore, two new species are described.

Abbreviations and Acknowledgements

The examined material is deposited in the following collections (abbreviations are used to refer to collections in the text):

CJB Collectio E. Jendek, Bratislava, Slovakia
CMM Collectio H. Mühle, München, Germany
CNA Collectio M. Niehuis, Albersweiler, Germany
HUB Museum der Humboldt - Universität, Berlin (F. Hieke), Germany
MGL Museé Guimet d'Histoire Naturelle, Lyon, France
MHNG Muséum d'Histoire naturelle, Genéve (I. Löbl), Switzerland
MHNP Muséum national d'Histoire naturelle, Paris (J. Menier), France
NMP Národní Museum, Praha (S. Bílý), Czech Republik
ZIL Zoological Institute, Academy of Sciences, St. Petersburg (M. Volkovitsh), Russia
ZSM Zoologische Staatsammlung, München (M. Baehr), Germany

The backslash (\) is used to indicate data from separate labels, my comments in the text are in square brackets with the abbreviations: (h) handwritten, (p) printed.

I thank all persons mentioned above for allowing me to study the necessary material. I am also very much obliged to Dr. H. Mühle and Dr. M. Niehuis for sending me valuable material. Thanks are also due to Dr. M. Jäch, V. Kubáň and Dr. I. Löbl for their critical comments and to Dr. P. Cate for the linguistic revision of the manuscript.

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Taxonomy

Species belonging to the *A. betuleti* (RATZEBURG, 1837) species group are characterized by the following features: 1) upper surface without distinct pubescence; 2) last abdominal ventrite regularly rounded; 3) pronotal disc with deep lateral depressions and with medial depression divided into two independent parts, apical one sometimes feeble or absent; 4) marginal and submarginal carinae of pronotum subparallel, not converging or joined near basal pronotal angles; 5) basal abdominal ventrite in male usually with shallow medial depression between metacoxae.

Only publications with nomenclatural changes are listed for each species.

Agrilus pseudocyaneus KIESENWETTER
(Fig. 8)

Agrilus pseudocyaneus KIESENWETTER, 1857: 150-151.
Agrilus nigricornis KIESENWETTER, 1857: 151. (unavailable name)
Agrilus aeneicornis KIESENWETTER, 1857: 151. (unavailable name)
Agrilus nigricornis SCHÜPPEL (in litt.) GEMMINGER & HAROLD, 1869: 1444 (unavailable name)
Agrilus aeneicornis SCHÜPPEL (in litt.) GEMMINGER & HAROLD, 1869: 1444 (unavailable name)
Agrilus obrucevi OBENBERGER, 1936: 106. **(syn.n.)**
Agrilus bialowiezaensis GUTOWSKI, 1993: 295-302. **(syn.n.)**

TYPE LOCALITY: "Bisher nur in Oesterreich [= Austria] sehr selten aufgefunden." (KIESENWETTER 1857).

TYPE SERIES: KIESENWETTER (1857) listed two specimens of *A. pseudocyaneus* in his description: "Im Berliner Museum befinden sich aus Schüppel's Sammlung ein Stück der typischen Form als *A. nigricornis* und ein anderes, der Varie angehörendes als *aeneicornis*, aus Oestereich." I examined these two specimens and I consider them to be syntypes (see below).

Lectotype [HUB], sex undetermined, here designated: "Agrilus nigricornis Mg [h] \ 12198 [p] \ Hist.-Coll. [p] Nr. 12198 [h] \ Zool. Mus. Berlin [p] [white label with black border] \ LECTOTYPE [p] Agrilus pseudocyaneus KIESW. [h] Ed. Jendek design. 1994 [p], X [h]". There is also another specimen labelled as "Agrilus aeneicornis Mg" which I consider to be a paralectotype.

A single specimen of *A. delphinensis* exists in the ZSM, labelled as the holotype of *A. pseudocyaneus*. Size (5.3 mm) and locality ("Hung") of that specimen do not agree with the data in the original description.

SYNONYMY: The names *A. nigricornis* and *A. aeneicornis* were originally introduced by KIESENWETTER (1857) reference to the specimens in Schüppel's collection (see above). By this nomenclatural act two unavailable names were created. GEMMINGER & HAROLD (1869) attributed these names incorrectly to Schüppel.

Lectotype female of *A. obrucevi* [NMP], here designated: "Okr. g. Obrutcha 18-VI-1928g [h] [in Russian] \ TYPUS [p] [red label] \ Agrilus Obručevi m. Type [h] Det. Dr Obenberger [p] \ LECTOTYPE [p] AGRILUS obrucevi Obnb. [h] Ed. Jendek design. 1993 [p] [red label]".

ALEXEEV & VOLKOVITSH (1989) synonymized *A. obrucevi* with *A. pratensis* and assumed that the type locality of this species "Siberia: Mount Obručev" was erroneously located in Transbaikalia instead of North Ukraine by OBENBERGER (1936). According to the conspecifity of this species with *A. pseudocyaneus* I also consider the Ukraine to be the true type locality.

I have examined 6 paratypes of *A. bialowiezaensis*. All specimens are conspecific with *A. pseudocyaneus*.

DIAGNOSIS: See GUTOWSKI (1993) under the name *A. bialowiezaensis*.

DISTRIBUTION: So far I have seen specimens of this species only from Austria, Switzerland, Poland, and Russia (Moscow region, Krasnodarsk region). SCHAEFER (1949) examined this species in Rey's collection [MGL] labelled "Hongrie [= Hungary] -Bauduer" and THÉRY (1942, 1945) saw another single specimen in the collection of Marseul [MHNP] from Germany.

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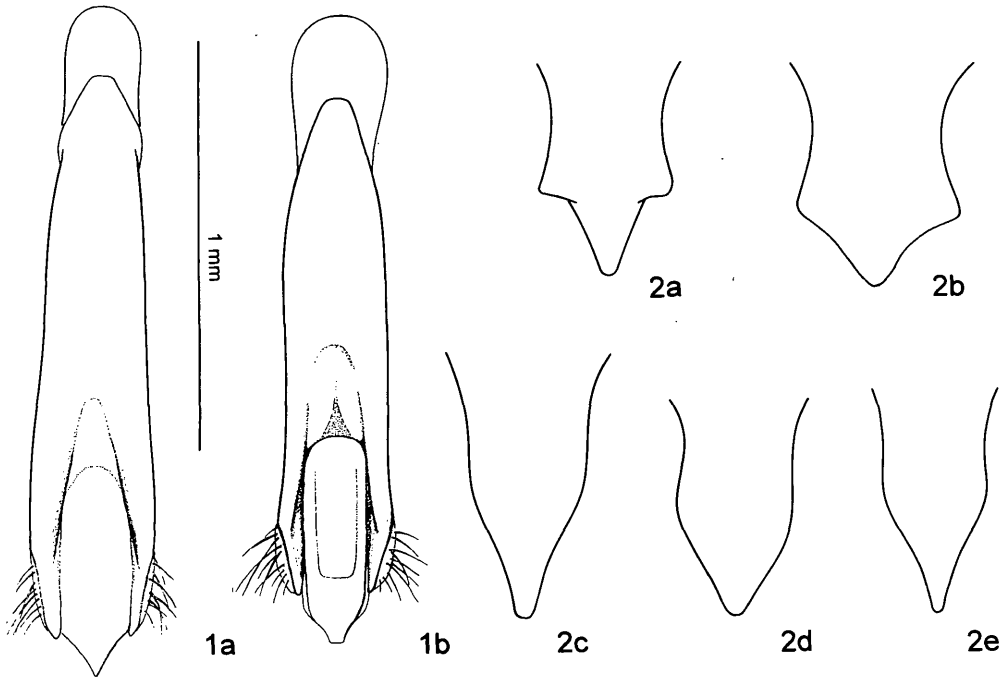

Fig. 1: Aedeagus (dorsal view), 1a) *Agrilus voriseki* sp.n., 1b) *A. fareastensis* sp.n. Fig. 2: Prosternal process, 2a) *A. fareastensis* sp.n. male, 2b) *A. fareastensis* sp.n. female, 2c) *A. pseudocyaneus*, 2d) *A. supremus*, 2e) *A. voriseki* sp.n.

HOST PLANT: *Populus tremula* (GUTOWSKI 1993).

ADDITIONAL MATERIAL EXAMINED:

SWITZERLAND: Filisur 9-10.VII.1935 leg. Dr. J.P. Wolf [MHNG].

POLAND: Puszcza Bialowieska, 12.VII.1981, leg. J. Gutowski [paratype] [CJB]; Puszcza Bialowieska, 15.VI.1988, leg. J.M. Gutowski [paratype] [CJB]; Puszcza Bialowieska, 13.VII.1988, leg. J.M. Gutowski [paratype] [CJB]; Puszcza Bialowieska, 27.VII.1989, leg. K. Kaznovki [paratype] [CJB]; Puszcza Bialowieska, 26.VI.1991, leg. A. Kuska [paratype] [CJB].

RUSSIA: "Moskovsk. gub. Serpuchovsk [= Serpuchov, cca 80 km S Moscow] Luzhki 5-VII-1928" [NMP]; "Sev. Kavkaz Teberda [= Krasnodarsk region, 180 km S Stavropol] 5-VII-40"[CJB].

Agrilus delphinensis ABEILLE DE PERRIN stat.rev.
(Fig. 6)

Agrilus delphinensis ABEILLE DE PERRIN, 1897: 12-13.
Agrilus pseudocyaneus delphinensis ABEILLE DE PERRIN: THÉRY, 1942: 157-158.
Agrilus pseudocyaneus KIESENWETTER: BEDEL, 1921: 202.
Agrilus pseudocyaneus eogenes OBENBERGER, 1930: 112. **(syn.n.)**

ABEILLE DE PERRIN (1897) had not seen the type specimens of *A. pseudocyaneus* and differentiated *A. delphinensis* only according to Kiesenwetter's description of *A. pseudocyaneus*. He later assigned *A. delphinensis* to *A. pseudocyaneus* in his collection because he was misled by Reitter, who gave him two specimens of the "true" *A. delphinensis* from Moravia erroneously labelled as *A. pseudocyaneus*. BEDEL (1921), having studied species in the collection of Abeille, synonymized *A. delphinensis* with *A. pseudocyaneus* (THÉRY 1942, 1945; SCHAEFER 1949).

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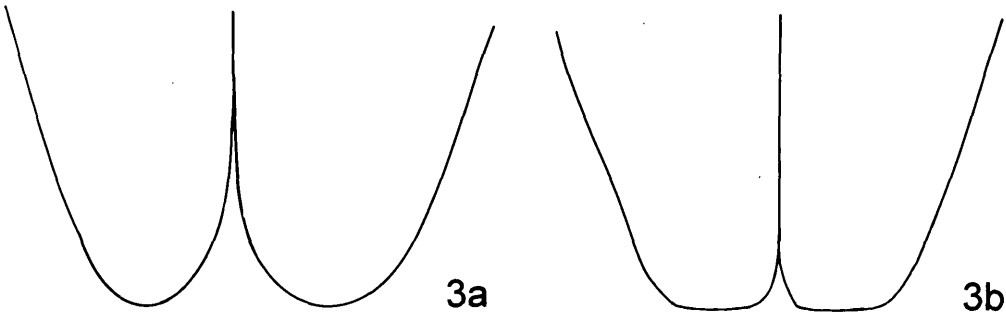

Fig. 3: Elytral apices, 3a) *A. pseudocyaneus*, 3b) *A. fareastensis* sp.n.

TYPE LOCALITY: West France, 20 km NW Grenoble, Voiron.

TYPE SERIES: Lectotype male [MHNP], here designated: "Voiron osiers E. ABEILLE [h] \ delphinensis typ. 97 Ab. [h] \ MUSEUM PARIS Coll. L. BEDEL 1922 [p] \ LECTOTYPE [p] Agrilus delphinensis Ab. 1897 [h] Ed. Jendek design. 1994 [p] [red label]" and 8 paralectotypes from the same locality.

SYNONYMY: Lectotype of *A. pseudocyaneus eogenes*, sex undetermined [NMP], here designated: "Primorje [h] \ TYPUS [p] [red label] \ Agrilus pseudocyaneus ssp. eogenes m. Type [h] det. Dr. Obenberger [p] \ LECTOTYPE [p] Agrilus pseudocyaneus eogenes OBNB., 1930 [h] Ed. Jendek design. 1994 [p] [red label]".

I have examined the lectotype of *A. pseudocyaneus eogenes* and also additional material from East Siberia. Comparison has shown that the characters given by OBENBERGER (1930) are insufficient and correspond to variability.

DISTRIBUTION: Eurosiberian. West to France and Germany, north to Finland, south to Italy, Serbia and Bosnia, throughout central and southern Russia, east to Russian Far East, Mongolia.

HOST PLANTS: *Salix viminalis, S. caprea.*

ADDITIONAL MATERIAL EXAMINED:

FRANCE: Moirans, 5.6.1947, L. Schaefer [MHNP].

CZECH REPUBLIC: MORAVIA: Břeclav, IV.1968, leg. L. Daněk [CJB]; 9.VII.1977, Vranovice, leg. V. Kubáň [CJB]; "Paskau" [= Paskov], leg. Reitter [HUB]; "Paskau" [= Paskov], leg. Dr. Graf [HUB].

SLOVAKIA: Hlohovec, 19.VII.1980, leg. M. Štrba [CJB].

RUSSIA: PRIMORSKIY REGION: Sichote-Alin Mts., Sokoltchi, 1-15.VII.1990, leg. Kadlec & Vořišek [CJB]; Khankajsk, 20 km NW Kamen Rybolov, 28.-29.VI.1974, leg. Loginova [ZIL]; Merkushevka, 13 km E of Dmitrijevka, 5.VI.1990, leg. Belokobylskij [ZIL]; Spassk, 13.VI.1990, leg. Belokobylskij [ZIL]; Ljalitchi, river Ilistaja, 4.VI.1990, leg. Belokobylskij [ZIL].

MONGOLIA: Central Ajmak, Tola River, 230 km NW Ulan-Bator, 13-16.VI.1975 [CJB]; Ulan-Bator, 26.VI.1988, leg. O. Majzlan [CJB].

Agrilus supremus OBENBERGER stat.n.
(Fig. 7)

Agrilus betuleti var. *supremus* OBENBERGER, 1917: 40.
Agrilus foveicollis supremus OBENBERGER: OBENBERGER, 1924: 42.
Agrilus foveicollis var. *supremus* OBENBERGER: OBENBERGER, 1926: 655.

TYPE LOCALITY: Russia, central Siberia, Kuznetski Alatau Mt.

TYPE SERIES: Lectotype male, here designated: "Kusnezk Altai, Gassner [p] \ TYPUS [p] [red label] \ foveicollis ssp. supremus m. Type [h] Det. Dr.Obenberger [p] \ Mus. Nat. Pragae Inv. [p] 24794 [h] [orange label] \

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LECTOTYPE [p] Agrilus betuleti var. supremus Ob. [h] Ed. Jendek design. 1993 [p] [red label]" and one paralectotype female from "Altaj, Kuzněck" are deposited in NMP. There is also another single specimen (female) labelled as type, which differs morphologically from the type series, its locality label "Preobraženskv - Sajan (Sibir.)" does not correspond to the type locality, and I do not consider it to be a paralectotype.

DIAGNOSIS: Closely related to *Agrilus voriseki* sp.n., from which it may be distinguished by characters given in the key. More material is needed to determine its morphological variability.

DISTRIBUTION: So far known only from Siberia: Kusnetski Alatau and Transbaikalia.

HOST PLANT: unknown.

ADDITIONAL MATERIAL EXAMINED:
RUSSIA: "Transbaikalia" [NMP].

Agrilus voriseki sp.n.
(Fig. 5)

TYPE LOCALITY: Russia, Primorskiy region, 65 km NE Spassk, Komarovka.

TYPE SERIES: **Holotype** male: "SIB. or. PRIMORJE, KOMAROVKA flum. KAMENUSHKA env. 300m Vorisek lgt. VI. 1992" [CJB]. **Paratypes**: 2 ex. "ASIA - AMUR r. REG. ARCHARA OBLUCIE ENV. 28.6.-17.7.91 ING. LORENC" [CJB]; 3 ex. the same data [CNA]; 1 ex. "ASIA-AMUR r. REG. ARCHARA 1991 OBLUCIE ENV. 28.6.-15.7. ING. KADLEC leg." [CJB]; 1 ex. "USSR SIBERIA AMURSKA oblast KUNDUR env. 1.7.-10.7. 1991 J. DALIHOD lgt." [CJB]; 1 ex. "SU Ussuri reg. Jasnoe 400 m 12-19.7.1989 M. Nikodým lgt." [CJB]; 1 ex. "Primorje Sokoltchi 20.6. 79 Koshpaksiv" [CJB]; 1 ex. "Ussuri" [NMP]; 2 ex. "USSR/Sibiria Primorskij Kraj, Novocugujevka 15.-20.7.1990 leg. Boukal" [CMM]; 1 ex. "USSR/Sibiria Primorskij Kraj, Novocugujevka 15.-20.7.1990 leg. Boukal" [CJB].

DESCRIPTION: 4.9 - 6.4 mm long, medium sized, dorsoventrally flattened. Coloration brown-green, golden-green or bronze with metallic lustre, sometimes slightly bicolorous. Upper side without distinct pubescence.

Frons moderately convex (dorsal view), diverging slightly upwards between eyes (frontal view); vertex wide and bulging (posterodorsal view), with sparse superficial punctuation, punctures sometimes prolonged to short longitudinal grooves. Vertex and upper part of frons with obvious medial groove. Eyes medium-sized, convex, slightly overreaching outline of head, lower part of eyes below upper side of antennal sockets. Vertex 2.1 - 2.4 times as wide as width of eye (dorsal view). Antennae serrate from fourth segment, as long or longer as width of pronotal base.

Pronotum transverse, pronotal index (l : w = 0.6 - 0.8), widest in apical half, medial lobe on anterior pronotal margin absent or poorly developed, not extending beyond outline of anteropronotal angles. Pronotal disc flattened, with dense but superficial transverse wrinkles and fine microsculpture. Medial part of disc with two shallow depressions, basal one longitudinal, apical one transverse. Lateral pronotal depressions deep, with smooth and shiny structure of surface. Prehumeral keels obtuse, only indicated in elytral structure in form of small knolls. Marginal and submarginal pronotal carinae subparallel, not joined before basal angles. Scutellum large, with transverse carina, posteromedially triangularly acuminate. Elytral index (l : w = 2.6 - 2.9), elytral apices separately truncate. Tarsi short, metatibiae shorter than metatarsi.

Mentoniere robust, deeply emarginate medially, prosternal process only slightly widening between coxae, pointed apically. Last abdominal ventrite rounded apically.

Male: Prosternum and metasternum with medial strip of whitish erect pubescence. Abdomen with medial shallow depression behind metacoxae. Aedeagus: see fig. 1a.

DISTRIBUTION: Russian Far East.

HOST PLANT: unknown.

ETYMOLOGY: Named for my colleague Jiří Voříšek who collected this species.

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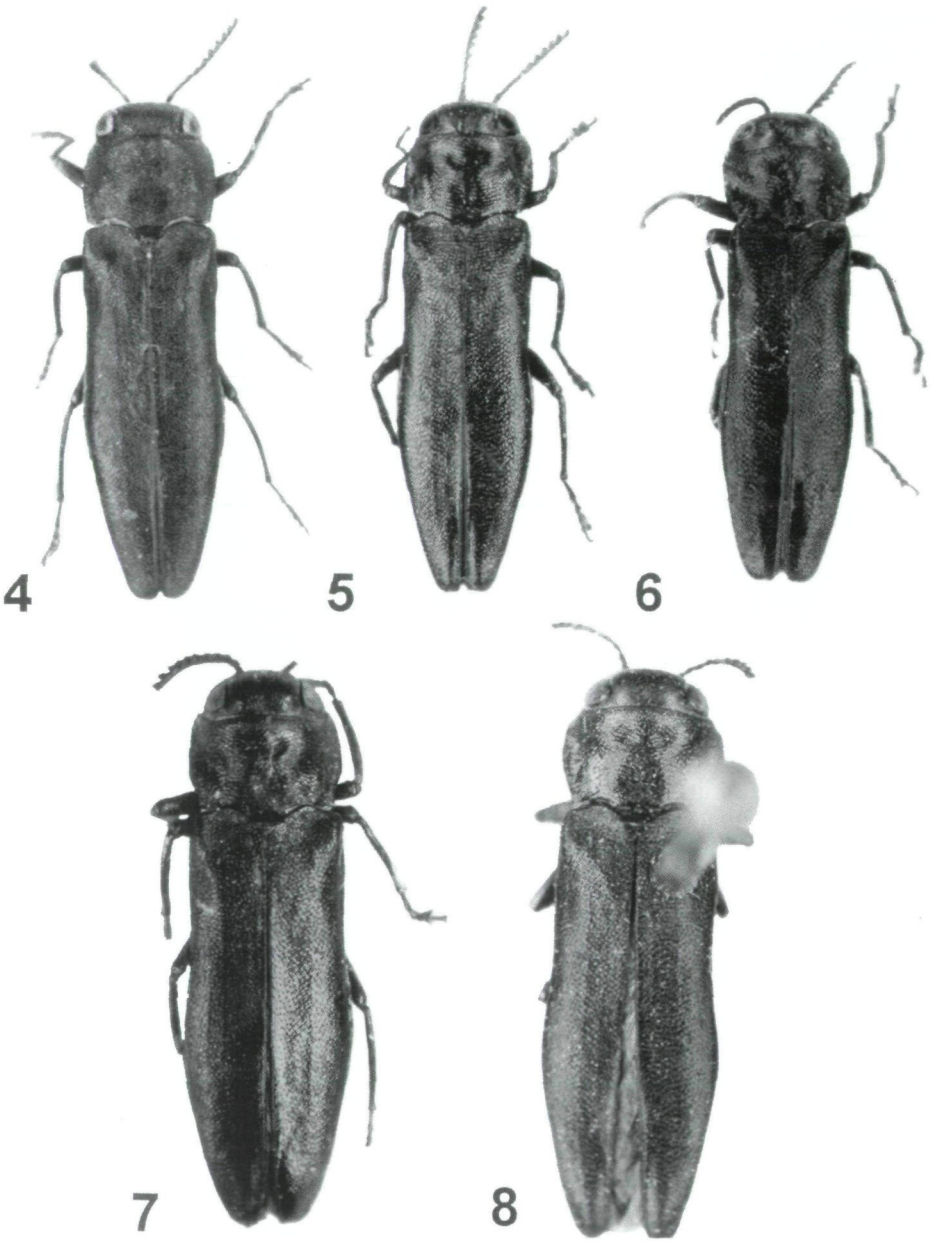

Figs. 4 - 8: Habitus of 4) *Agrilus fareastensis* sp.n. (holotype), 5) *A. voriseki* sp.n. (holotype), 6) *A. delphinensis* (lectotype), 7) *A. supremus* (lectotype), 8) *A. pseudocyaneus* (lectotype).

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Agrilus fareastensis sp.n.
(Fig. 4)

TYPE LOCALITY: Russia, Khabarovskiy region, 30 km S Khabarovsk, Mt. Khekhcir.

TYPE SERIES: **Holotype** male: "Sib. or. 7.1977 Chechcir chrebet Ing.Gotwald lgt." [CJB]. **Paratypes**: 1 female "Primorie zap. KEDROVAJA PAD 30.V.1983 Zlobin" [CJB]; 1 female "Primorje" [CMM]; 1 female "Sib. or. -m. Primorje Sichote-Alin Mts. Sokolči 1-15.7.1990 Kadlec + Voříšek lg." [CJB].

DESCRIPTION: 5.9 - 6.2 mm long, robust and vaulted, black or brown-black with green silky lustre, dorsally without distinct pubescence, ventrally with sparse whitish hairs.

Frons regularly convex (dorsal view), subparallel or slightly arcuately converging upwards between eyes (frontal view); vertex convex, with fine medial groove (posterodorsal view), densely and coarsely grooved, with interspaces as wide as each groove. Eyes small, convex, projecting beyond outline of head, vertex 3.3 - 3.6 times as wide as width of eye (dorsal view). Antennae serrate from fourth segment, in male as long as width of pronotal base.

Pronotum transverse, pronotal index (l : w = 0.6 - 0.7), widest in the middle, anterior pronotal lobe broad, projecting slightly beyond outline of anterior pronotal angles. Pronotal disc with dense transverse wrinkles, strongly convex, laterally with conspicuous depressions, anteromedially and posteromedially with shallow but distinct depressions. Prehumeral keels rib-shaped, shiny and elevated, projecting to basal third of pronotum; subparallel with lateral pronotal margin. Marginal and submarginal pronotal carinae subparallel, not joined before basal angles. Scutellum large, with transverse carina and triangular posteromedial projection.

Elytral index (l : w = 2.7 - 2.8); elytra in apical part almost linearly narrowed to elytral apices, apices separately truncate. Tarsi short and slender, only feebly enlarged apically, metatibiae shorter than metatarsi.

Mentoniere large, broadly emarginate medially. Prosternal process wide, distinctly enlarged between coxae toward sharp lateral angles, apex arcuately pointed. Last abdominal ventrite regularly rounded apically. Aedeagus: see fig. 1b.

DISTRIBUTION: Russian Far East.

HOST PLANT: unknown.

ETYMOLOGY: Named in reference to its distribution.

Key to the species

1 4.0 - 5.3 mm long, body slender, unicolorously blue; frons between eyes distinctly linearly diverging upwards (frontal view); mentoniere narrow, slightly emarginate medially; transverse anteromedial depression on the pronotal disc feeble or absent ..... ***delphinensis***

\- 4.9 - 7.8 mm long; body robust, blue, bronze, golden-green, brown-green, brown-black, black, sometimes slightly bicolorous; frons between eyes subparallel or slightly arcuately diverging upwards (frontal view); mentoniere large, deeply emarginate medially; transverse anteromedial depression on the pronotal disc distinct 2

2 Prosternal process distinctly widened between coxae (figs. 2a, 2b), with obvious lateral angles; prehumeral pronotal keels elevated, rib-shaped; vertex and pronotal disc with rough structure, surface in lateral pronotal depressions as on pronotal disc; black, brown-black; 5.9 - 6.2 mm long ..... ***fareastensis* sp.n.**

\- Prosternal process subparallel or slightly widened between coxae (figs. 2c, 2d, 2e), without laterally projecting angles; prehumeral pronotal keels knoll-like, obtuse or only indicated in pronotal structure; vertex and pronotal disc with fine superficial structure, surface in lateral pronotal depressions smooth and shiny 3

3 Elytral apices separately evenly rounded (fig. 3a); lateral pronotal depressions deep and

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conspicuous; prehumeral pronotal keels distinct, knoll-like; 5.6 - 7.8 mm long; blue or slightly bicolorous ..... ***pseudocyaneus***

- Elytral apices separately truncate (fig. 3b); lateral pronotal depressions less deep; prehumeral pronotal keels only indicated in pronotal structure 4

4 Pronotal disc flattened, pronotum widest in anterior half; eyes convex, distinctly projecting beyond outline of head; 4.9 - 6.4 mm; brown-green, golden-green or bronze ..... ***voriseki* sp.n.**

- Pronotal disc vaulted, pronotum widest in middle; eyes flat, not or only slightly projecting beyond outline of head; 5.9 - 6.5 mm; black-blue, black-green ..... ***supremus***

Zusammenfassung

Zwei neue Arten der Gattung *Agrilus* DAHL, 1823 aus der *A. betuleti* Artengruppe werden beschrieben: *A. fareastensis* sp.n. und *A. voriseki* sp.n.; *A. delphinensis* ABEILLE DE PERRIN wird als gute Art revalidiert, *A. supremus* OBENBERGER wird auf Artrang erhoben und 3 neue Synonymien werden vorgestellt (*A. pseudocyaneus* KIESENWETTER = *A. obrucevi* OBENBERGER und *A. bialowiezaensius* GUTOWSKI; *A. delphinensis* = *A. eogenes* OBENBERGER). Von folgenden Arten werden Lectotypen designiert: *Agrilus pseudocyaneus* KIESENWETTER, *Agrilus delphinensis* ABEILLE DE PERRIN, *Agrilus supremus* OBENBERGER.

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