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Revision of the genus *Callipteroma* Motschulsky, 1863 (Hymenoptera: Encyrtidae)

Ревизия рода *Callipteroma* Motschulsky, 1863 (Hymenoptera: Encyrtidae)

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KEY WORDS: Hymenoptera, Encyrtidae, *Callipteroma*, Eastern Hemisphere, taxonomy, key, new synonymy.

КЛЮЧЕВЫЕ СЛОВА: Hymenoptera, Encyrtidae, *Callipteroma*, Восточное полушарие, таксономия, определительная таблица, новые синонимы.

ABSTRACT: A diagnosis of the genus *Callipteroma* Motschulsky, 1863 (Hymenoptera: Encyrtidae), a key to females of its six known species, and their synopsis are given based on examination of the type material of four of them. Taxonomic position of *Callipteroma* is discussed. *Proleptomastidea* Trjapitzin, 2009 **syn.n.** is synonymized under *Callipteroma* and its sole species, *P. enigmatica* (Trjapitzin, 1971), is transferred to *Callipteroma* as *C. enigmatica* (Trjapitzin, 1971) **comb.n.** *Callipteroma baglanensis* Myartseva, 1982 **stat.rev.** from Afghanistan is treated, albeit provisionally, as not being a synonym of *C. testacea* Motschulsky, 1863. *Leptomastix calopterus* Masi, 1921, **syn.n.** from Libya is synonymized under *C. sexguttata* Motschulsky, 1863. Lectotypes of the three species of *Callipteroma* described by Motschulsky from Sri Lanka, *C. quinqueguttata* Motschulsky, 1863 (a synonym of *C. sexguttata*), *C. sexguttata*, and *C. testacea*, and also of *Encyrtus nietneri* Motschulsky, 1859 (now *Microterys nietneri* (Motschulsky, 1859)) are designated. Only one species of *Callipteroma*, *C. sexguttata*, is known to occur in Russia.

РЕЗЮМЕ: В статье приводятся диагноз рода *Callipteroma* Motschulsky, 1863 (Hymenoptera: Encyrtidae), определительная таблица шести его известных видов, а также дан их обзор на основе исследования типового материала четырёх из них. Обсуждается таксономическое положение *Callipteroma*. *Proleptomastidea* Trjapitzin, 2009 **syn.n.** сведён в синонимы к *Callipteroma* и его единственный вид, *P. enigmatica* (Trjapitzin, 1971), переведён в *Callipteroma* как *C. enigmatica* (Trjapitzin, 1971) **comb.n.** *Callipteroma baglanensis* Myartseva, 1982 **stat.rev.** из Афганистана трактуется предварительно не как синоним *C. testacea* Motschulsky, 1863. *Leptomastix calopterus* Masi, 1921, **syn.n.** из Ливии сведён в синонимы к *C. sexguttata* Motschulsky, 1863. Выделены и обозначены лектотипы трёх видов *Callipteroma* описанных Мочульским из Шри-Ланки: *C. quinqueguttata* Motschulsky, 1863 (синоним *C. sexguttata*), *C. sexguttata* и *C. testacea*, а также *Encyrtus nietneri* Motschulsky, 1859 (теперь *Microterys nietneri* (Motschulsky, 1859)). Только один вид *Callipteroma*, *C. sexguttata*, известен из России.

Introduction

Only six species of *Callipteroma* Motschulsky, 1863 (Hymenoptera: Encyrtidae) are currently recognized. Three nominal species of this genus were described [Motschulsky, 1863] from Ceylon (now Sri Lanka) by the famous Russian entomologist Victor Ivanovich Motschulsky (1810–1871), whose memoirs were published by Krivokhatsky and Mikhailov [2013]. During the last 50 years, the senior author has examined the types of Encyrtidae described by Motschulsky; these are deposited in the collection of Zoological Museum of M.V. Lomonosov Moscow State University, Moscow, Russia. Among them redescriptions of the following species were published to this date: *Diversinervus paradisicus* (Motschulsky, 1863) [Trjapitzin, 1961], *Charitopus cuprifrons* (Motschulsky, 1863) [Trjapitzin, 2008], and *Microterys nietneri* (Motschulsky, 1859) [Trjapitzin et al., 2008]. Redescription of *Callipteroma testacea* Mots-

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chulsky, 1863, collected by Y.S. Darevsky in Comodo and Padar Islands (Indonesia), was prepared in comparison with the male syntype of this species [Trjapitzin, 1965].

syn.n.

Acronyms of the depositories of the specimens are as follows: BMNH — The Natural History Museum, London, England, UK; HNHM — Hungarian Natural History Museum, Budapest, Hungary; IBCM — Institute of Genetics, Physiology and Plant Protection (formerly Institute of Plant Protection and Ecological Agriculture), Academy of Sciences of Moldova, Kishinev (Chisinau), Moldova; MNCN — Museo Nacional de Ciencias Naturales, Madrid, Spain; SIZK — I.I. Schmalhausen Institute of Zoology, National Academy of Sciences of Ukraine, Kiev, Ukraine; UCRC — Entomology Research Museum, University of California, Riverside, California, USA; ZISP — Zoological Institute, Russian Academy of Sciences, Saint Petersburg, Russia; ZMHB — Museum für Naturkunde, Humboldt-Universität, Berlin, Germany; ZMMU — Zoological Museum of M.V. Lomonosov Moscow State University, Moscow, Russia.

Using this opportunity, here we also designate a lectotype [ZMMU] of *Encyrtus nietneri* Motschulsky, 1859 (now *Microterys nietneri* (Motschulsky, 1859)) to avoid any ambiguity about the type material of this subtropical and tropical species, an effective parasitoid of Coccidae (Hemiptera), and its identity because Motschulsky [1859] did not mention any specimens in its original description; Trjapitzin et al. [2008] studied the syntypes of this taxon from Sri Lanka but did not designate a lectotype. The syntypes of *Encyrtus nietneri* (6 females, ZMMU) are mounted on two pins, as follows. The first pin (with 5 females on a paper triangle) is labeled (from above): 1. [a small red quadrate]; 2. [a small yellow circle]; 3. [rectangle] "Type"; 4. [a white original label either of Motschulsky or Nietner] "Parasit auf *Pseudococcus coffeae*"; 5. [a big yellow label in handwriting of Motschulsky] "*Encyrtus Nietneri* Motsch. Ceylon" [then illegible]; 6. [a red label written by V.A. Trjapitzin] "Lectotypus and paralectotypi, ♀♀, *Encyrtus nietneri* Motschulsky. Lectotypus: foremost specimen, design. Sugonjaev et Trjapitzin" [this designation was never published]; 7. [white] "Micr. Slides [in Russian] N2681 (Lectotypus) , 2682 (Paralectotypus)" [these slides were prepared by E.S. Sugonjaev and are deposited in ZISP]; 8. [in handwriting of V.A. Trjapitzin] "*Microterys nietneri*. Det. V.A. Trjapitzin, 2008". The lectotype designated here is the same specimen as indicated as such on the labels (but not previously published); the other specimens are paralectotypes. The second pin (with 1 female paralectotype) is labeled as follows: 1. a yellow circlet; 2. 6. [a red label written by V.A. Trjapitzin] "Paralectotypus. *Encyrtus nietneri* Motschulsky, ♀ Design. Sugonjaev et Trjapitzin" [this designation was never published]; 3. [red] "*Microterys nietneri* (Motschulsky), ♀"; 4. [white] "*Microterys nietneri* (Motschulsky), ♀. Det. V.A. Trjapitzin".

Genus *Callipteroma* Motschulsky, 1863

Callipteroma Motschulsky, 1863: 35.

Type species: *Callipteroma sexguttata* Motschulsky, 1863, by subsequent designation [Ashmead, 1900: 402 (as *Callipteroma quinqueguttata* Motschulsky, 1863)].

Calliopteroma Dalla Torre, 1898: 307 (invalid emendation).

Calocerinella Girault, 1913: 46–47.

Type species: *Calocerinella trifasciatus* [correct spelling: *trifaciata*] Girault, 1913, by monotypy. Synonymy by Noyes, 1978: 539.

Callipteroma: García Mercet, 1921: 56, 115-116; Gahan, Fagan, 1923: 26; Noyes, 1978: 539–540; Noyes, Hayat, 1984: 244; Kaul, Agarwal, 1986: 53–55; Mani, 1989: 813–814; Trjapitzin, 1989: 44, 145–147; Noyes, Hayat, 1994: 250–252; Hayat, 2006: 264.

Proleptomastidea Trjapitzin, 2009: 165, 176, **syn.n.**

Type species: *Leptanusia enigmatica* Trjapitzin, 1971b, by original designation and monotypy.

DIAGNOSIS. **Female**. Body compact, not flattened, without metallic luster. Frontovertex very broad. Scrobes either connected or separated above. Toruli above lower eye margin level. Scape not broadened, long; funicle 6-segmented, with all segments longer than wide; clava 3-segmented, short, not truncate at apex, sutures dividing claval segments transverse. Mandible with 2 acute teeth. Palpal formula in *C. sexguttata* 4–3. Pronotum short. Mesoscutum without notauli. Scutellum triangular. Wings not abbreviated; fore wing long, strongly darkened (brown) and with light spots (Figs 1, 5–6) or with alternating hyaline transverse or oblique (Figs 3–4, 7–8) fasciae; costal cell almost absent or very narrow; marginal vein somewhat longer than wide; stigmal vein with uncus; postmarginal vein rather well developed. Legs long and thin; mesotibial spur long. Propodeum, except its longitudinally depressed median part, with light pubescence. Gaster short: 1st gastral (= 3rd abdominal) tergite either rounded posteriorly (e.g., in the type species, Fig. 1) or with a large triangular projection in the middle (Fig. 7); pygostyles near base of gaster. Hypopygium extending to apex of gaster. Ovipositor not exserted. Body length 1.3–2.5 mm.

Male. Funicle segments long, with long setae; clava entire. Pattern on fore wing disc similar to that of female.

REMARKS. It remains to be demonstrated whether inclusion in the same genus (*Callipteroma*) of the species with the 1st gastral tergite either rounded posteriorly or with a large triangular projection in the middle is justified.

DISTRIBUTION. Species of *Callipteroma* are more or less common in the tropical and subtropical Regions of the Old World; in the Palearctic Region they occur predominantly in steppes, semideserts, and in other arid habitats. The most northern finds of the genus are from Slovakia, Moldova and Orenburgskaya Oblast' of Russia.BIOLOGY. Without any doubt, most *Callipteroma* species are primary endoparasitoids of mealybugs (Hemiptera: Pseudococcidae), as are most Tetracneminae, but the tentatively included *C. enigmatica* was reared from Eriococcidae (Hemiptera) [Myartseva, 1978].

SYSTEMATIC POSITION. Motschulsky [1863] placed *Callipteroma* in the family Braconidae. Ashmead [1900] transferred it to the subfamily Encyrtinae, then within the family Chalcididae (which now corresponds to the superfamily Chalcidoidea). Trjapitzin [1968] established the subtribe Leptomastideii (now Leptomastideina Trjapitzin, 1968) in the tribe Anagyrini Hoffer, 1953 of the subfamily Tetracneminae. This subtribe was defined based on the position of the wing of the active, live adults holding them erect (vertically or aslantly). Its members then included, besides *Callipteroma*, the genera *Leptomastidea* García Mercet, 1916 and *Leptanusia* De Santis, 1964 [Trjapitzin, 1968], but the latter is now considered to be a synonym of another closely related genus, *Gyranusoidea* Compere, 1947 [Noyes, 1980].

Recently, Trjapitzin [2009] added *Proleptomastidea* Trjapitzin, 2009 as another member of this subtribe, with *Leptanusia enigmatica* Trjapitzin, 1971 as type species of the genus. Because it is not clear (and mostly unknown) if live adults of most species comprising *Gyranusoidea* hold their wings erect, at an angle, or fold them (possibly, some do and some do not), and the genus itself is extremely difficult to separate morphologically from *Anagyrus* Howard 1896 and *Leptomastidea* [Triapitsyn et al., 2014], the current, rather ambiguous, subtribal arrangement within the Anagyrini would need to be re-assessed based on a thorough phylogenetic study using evidence from both morphological and molecular data, which are now lacking. It is quite unlikely that such closely related and similar, rather poorly defined genera would belong to different subtribes within the Anagyrini. According to personal observations of the junior author of this communication, live adults of *Gyranusoidea indica* Shafee, Alam & Agarwal, 1975 hold their wings at a 30° to 40° angle to the body axis (Fig. 10), whereas those of *Leptomastidea abnormis* (Girault, 1915) and *Leptomastidea* sp. from Puerto Rico [Triapitsyn et al., 2014] hold them erect, almost perpendicular to the body; on the other hand, live adults of *Anagyrus kamali* Moursi, 1948 fold their wings and hold them parallel to the body axis.

Proleptomastidea was very briefly, rather poorly defined and separated from *Leptomastidea* based on a larger body size, the palpal formula of 4–3, and a shorter postmarginal vein of the fore wing. These features are of a doubtful generic value and two of them were vaguely indicated, except for the palpal formula, which is the same as in the only known such formula in *C. sexguttata*. However, palpal formula is known to vary a lot in some other, unrelated genera of Encyrtidae and is often size-dependent: the larger species having more palpal segments than smaller ones within the same genus. Therefore, we hereby synonymize, with some reservations, *Proleptomastidea* under *Callipteroma* because the former nominal genus more or less fits the above diagnosis of the latter, which is the oldest described taxon in this unstable and difficult to figure out group and thus would preserve its name even in the likely scenario that *Leptomastidea* may eventually be recognized as a junior synonym of *Callipteroma*, whether completely or partially, or in combination with at least some species of *Gyranusoidea*. Such a generic revision, preferably of the entire Anagyrini, is well beyond the scope of this communication, and would require a detailed study of several key morphological structures, particularly of gaster.

Vosleria Timberlake, 1926, which had been treated as a synonym of *Callipteroma* by Noyes and Hayat [1984] but later was resurrected by them as a valid genus [Noyes, Hayat, 1994], is also in or near that mix of rather fuzzily delimited genera that was called by Noyes and Hayat [1994] the *Leptomastix* Foerster, 1856 lineage within the Anagyrini. The junior author examined and identified the following specimens of the only described member of *Vosleria*, *V. australia* (Girault, 1917): AUSTRALIA: New South Wales, Sydney, 1931, S. Flanders, "Ex. Mealy bug on grass roots" [1 female, UCRC] (determined by H. Compere as *Vosleria signata* Timberlake, 1926); Queensland: Brisbane, Acacia Ridge, 15.ix.1980, G. Gordh [1 female, UCRC] (Fig. 9); Calam Rd., 31.viii.1980, G. Gordh, E. Dahms [1 female, UCRC]; Browns Plains, 13.ix.1980, G. Gordh, E. Dahms [1 female, UCRC]; Cape Hillsborough National Park, 15.x.1979, H. E. Evans [1 female, UCRC]; Gatton, 11.ix.1980, G. Gordh, E. Dahms [1 female, UCRC]. Also, there are many males with hyaline fore wings in the UCRC that were determined by J. S. Noyes in 1998 as ?*Vosleria* sp.; many of these were collected in Queensland, Australia in the same localities and about at the same time as the females of *V. australia* listed above (determined by J. S. Noyes in 1998 as *Vosleria* sp.), so they very well could be conspecific with them.

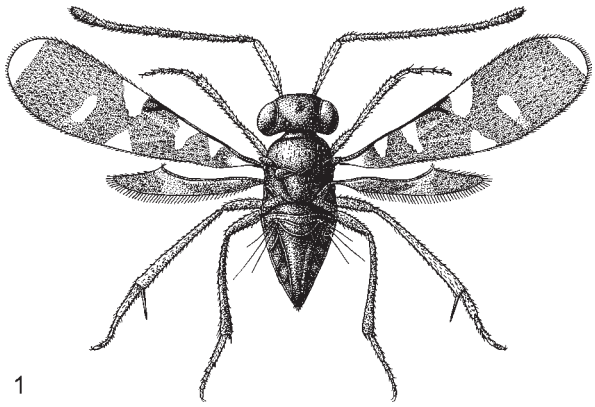


Fig. 1. *Callipteroma sexguttata*, female habitus (drawing by E.K. Herthevtzian).

Рис. 1. *Callipteroma sexguttata*, габитус самки (рисунок Е.К. Эртевцян).

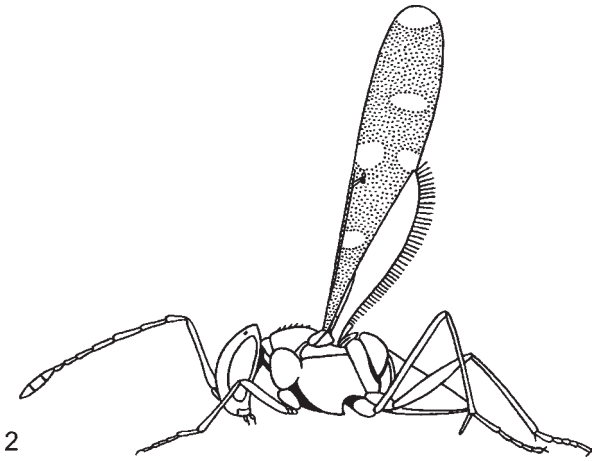


Fig. 2. *Callipteroma sexguttata*, female habitus [from García Mercet, 1921].

Рис. 2. *Callipteroma sexguttata*, габитус самки [по García Mercet, 1921].

Callipteroma enigmatica (Trjapitzin, 1971) **comb.n.** (Fig. 4) holds its wings erect (personal observation of the first author [Trjapitzin, 1971b]) as do other members of this genus.

Key to species of *Callipteroma* (females)

1(2) Clava with two apical segments yellowish-white. Length of body 1.7 mm ..... 1. *C. albiclava*

2(1) Clava unicolorous, dark.

3(6) Posterior margin of 1st gastral tergite not triangular, rounded (Figs 1, 4).

4(5) Fore wing beyond venation mostly dark brown, with 4 small hyaline spots (Fig. 1). Length of body 1.3–2.5 mm ..... 5. *C. sexguttata*

5(4) Fore wing beyond venation with 1 brown transverse band and 2 hyaline transverse bands (Fig. 4). Length of body 1.5–2.0 mm ..... 3. *C. enigmatica*

6(3) Posterior margin of 1st gastral tergite triangular (Fig. 3).

7(8) Basal edge of 3rd dark fascia on fore wing without a triangular projection. Length of body 1.7 mm .... 4. *C. nigra*

8(7) Basal edge of 3rd dark fascia on fore wing with a triangular projection (Fig. 3).

9(10) Propodeum in the middle with a thin longitudinal keel. Length of body 2.2 mm ..... 2. *C. baglanensis*

10(9) Propodeum in the middle without keel. Length of body 2.2 mm ..... 6. *C. testacea*

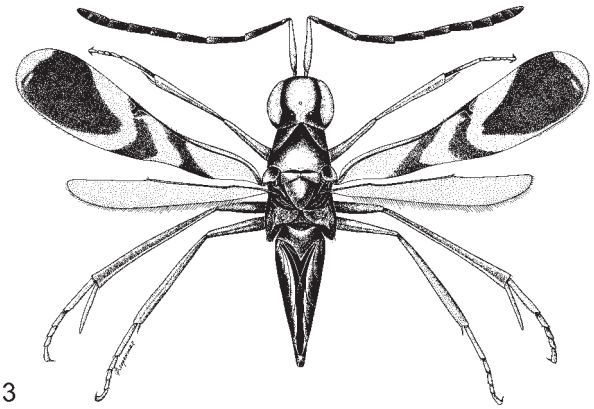


Fig. 3. *Callipteroma baglanensis*, female habitus, holotype (drawing by N.A. Florenskaya).

Рис. 3. *Callipteroma baglanensis*, габитус самки, голотип (рисунок Н.А. Флоренской).

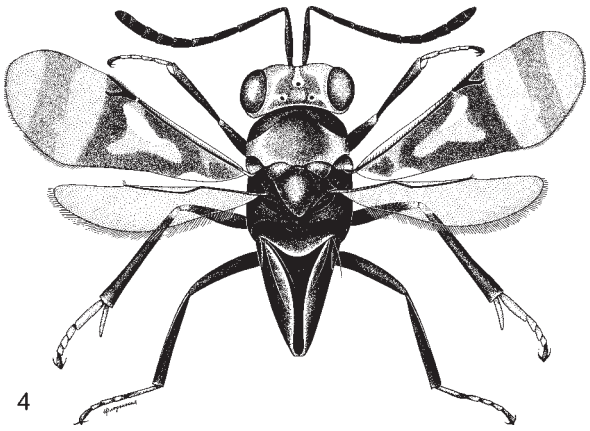


Fig. 4. *Callipteroma enigmatica*, female habitus (drawing by N.A. Florenskaya).

Рис. 4. *Callipteroma enigmatica*, габитус самки (рисунок Н.А. Флоренской).

Alphabetical synopsis of species

1. *Callipteroma albiclava* Noyes, 1978

Noyes, 1978: 541–543.DISTRIBUTION. Republic of South Africa.

HOSTS. Unknown.

2. *Callipteroma baglanensis* Myartseva, 1982, **stat.rev.**

Fig. 3.

Trjapitzin, 1971a: 77 (*Callipteroma* sp.); Myartseva, 1982: 45–46 (*C. baglanense*); Trjapitzin, 1989: 147; Noyes, Hayat, 1994: 257 (possibly a synonym of *C. testacea* Motschulsky, 1863); Japoshvili, Noyes, 2005: 137 (as *C. testacea*).

DISTRIBUTION. Afghanistan.

HOSTS. Unknown.

TYPE MATERIAL EXAMINED. Holotype (Fig. 3) female [ZISP] on point: Baglan, North Afghanistan, sandy plot of floodlands with sparse gramineous plants, and also with tamarisk and sugarcane, 7.ix.1966 (E.S. Sugonjaev) [label in Russian]. Also some body parts on slide No. 1649.

REMARKS. According to Noyes and Hayat [1994], *C. baglanensis* may be synonymous with *C. testacea* because both nominal species have an elongate and flat propodeum, and their pattern of infuscation of the fore wing is somewhat similar (although not matching), also considering some variability of that in *C. testacea*. Later, Japoshvili and Noyes [2005] formally synonymized the former under the latter. Their nomenclatural action deserves attention, but for now we cannot accept it because there is a difference between them in the structure of the propodeum (see the key). Unfortunately, on the habitus drawing of the holotype female of *C. baglanensis* (Fig. 3) a thin longitudinal keel on the propodeum, characteristic of this species, is not shown. More material of this species (now non-existent) is needed to be examined to better assess its validity.

3. *Callipteroma enigmatica* (Trjapitzin, 1971), **comb.n.**

Fig. 4.

Trjapitzin, 1971b: 86–89 (*Leptanusia*); Hoffer, 1975: 112–112 (*Leptanusia*); Myartseva, 1978: 163–164 (*Leptanusia*); 1984: 116, 203 (*Leptanusia*); 1986: 217 (*Leptanusia*); Trjapitzin, 1989: 143 (*Leptomastidea*); 2009: 203–204 (*Proleptomastidea*).

DISTRIBUTION. Algeria and Turkmenistan.

HOST. *Neoacanthococcus tamaricicola* Borchsenius, 1948 (Eriococcidae) on *Tamarix* sp. [Myartseva, 1978].

4. *Callipteroma nigra* García Mercet, 1924

García Mercet, 1924: 258–260; Nikol'skaya, 1952: 346; 1963: 353; Noyes, 1978: 541, 545–546; Trjapitzin, 1989: 147.

DISTRIBUTION. Spain.

HOSTS. Unknown.

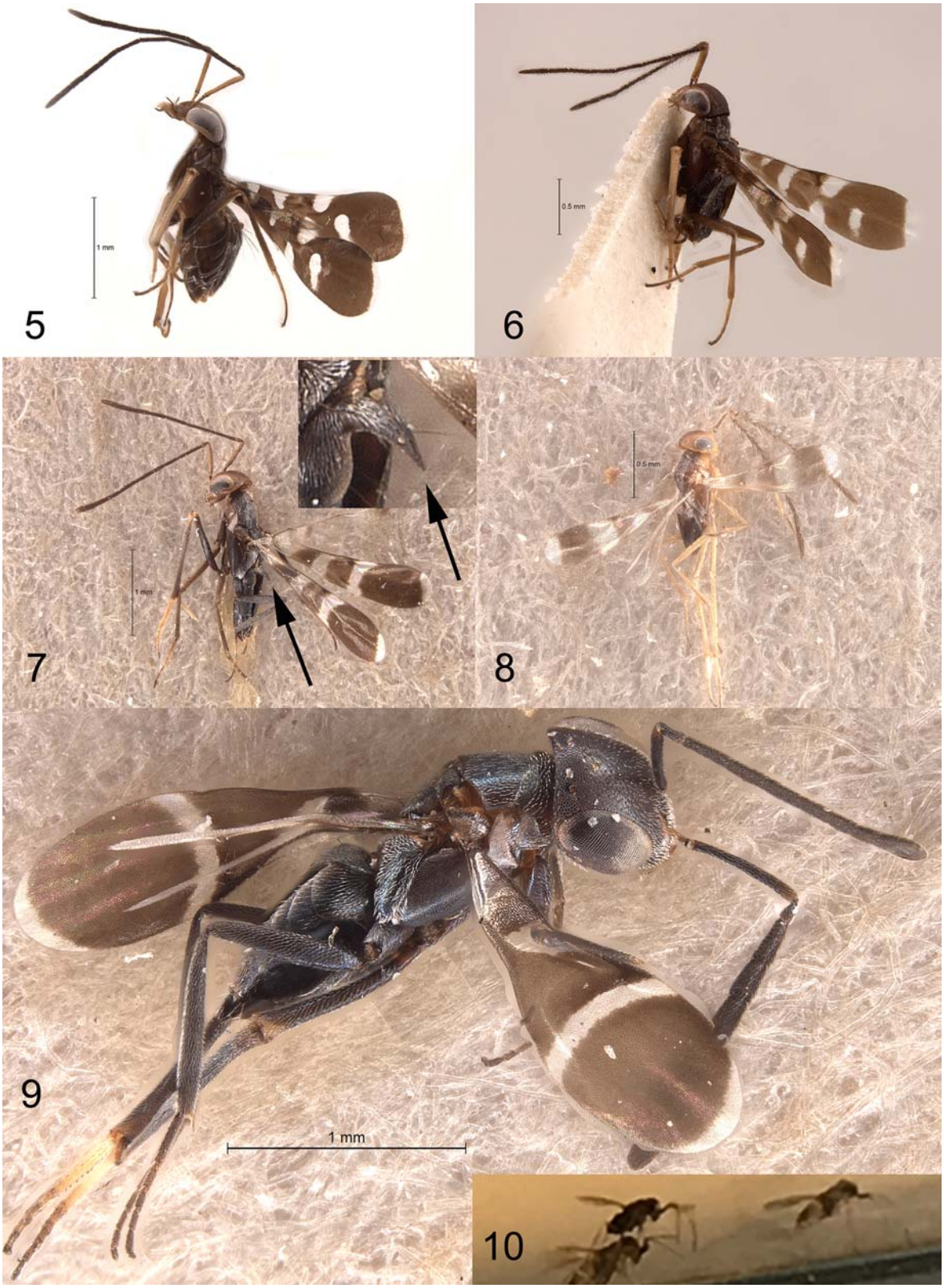
TYPE MATERIAL EXAMINED. Holotype female [MNCN]: Rivas-Vaciamadrid, Madrid, Spain.

5. *Callipteroma sexguttata* Motschulsky, 1863

Figs 1–2, 5–6.

Callipteroma quinqueguttata Motschulsky, 1863, synonymy by Bouèek, 1977: 70; *Leptomastix guttatipennis* Girault, 1915, synonymy under *C. quinqueguttata* by Noyes, 1978: 546; *Leptomastix guttatipennis io* Girault, 1919, synonymy under *C. quinque-*

Рис. 5–10. *Callipteroma* spp.: 5–6, 8 — *C. sexguttata* (5 — Исследовательский центр Мпала, графство Лаикипия, Кения; 6 — Фальшивый Геленджик, Краснодарский край, Россия; 8 — Акация Ридж, Брисбен, Квинсленд, Австралия); 7 — *C. testacea* (Гаттон, Квинсленд, Австралия; стрелки указывают на 1-й тергит гастера, в т.ч. на вставке); 9 — *Vosleria australia* (Акация Ридж, Брисбен, Квинсленд, Австралия); 10 — *Gyranusoidea indica* (из колонии в карантинной лаборатории Калифорнийского университета в Риверсайде); 5, 7, 9 — габитус самки; 6, 8 — габитус самца; 10 — взрослые особи.



Figs 5–10. *Callipteroma* spp.: 5–6, 8 — *C. sexguttata* (5 — Mpala Research Centre, Laikipia County, Kenya; 6 — Fal'shivyy Gelendzhik, Krasnodarskiy Kray, Russia; Acacia Ridge, Brisbane, Queensland, Australia); 7 — *C. testacea* (Gatton, Queensland, Australia; arrows point to 1st gastral tergite, including on the insert); 9 — *Vosleria australia* (Acacia Ridge, Brisbane, Queensland, Australia); 10 — *Gyranusoidea indica* (from colony in University of California at Riverside quarantine laboratory); 5, 7, 9 — female habitus; 6, 8 — male habitus; 10 — live adults.

guttata by Noyes, 1978: 546; *Leptomastix calopterus* Masi, 1921, **syn.n.**; *Callipteroma kiushiuensis* Ishii, 1928, synonymy under *C. quinqueguttata* by Tachikawa, 1962: 79.

Motschulsky, 1863: 36–37 (*C. quinqueguttata*), 37 (*C. sexguttata*); Girault, 1915: 151 (*Leptomastix guttatipennis*); 1919: 165 (*Leptomastix guttatipennis io*); Masi, 1921: 301–303 (*Leptomastix calopterus*); García Mercet, 1921: 116–119, 688; Ishii, 1928: 96–98 (*C. kiushiuensis*); Nikol'skaya, 1952: 346; 1963: 353; Tachikawa, 1963: 53–54 (*C. quinqueguttatum*); Erdős, 1964: 56–57; Mani, Kaul, 1974: 67–71 (*C. sexguttata*); 71–72 (*C. quinqueguttata*); Hayat, 1974: 407–408 (*C. quinqueguttata*); Noyes, 1978: 546–548 (*C. quinqueguttata*); Trjapitzin, 1978: 277 (*C. sexguttatum*); Myartseva, 1984: 118, 205 (*C. sexguttatum*); Kaul, Agarwal, 1986: 55–57 (*C. quinqueguttatum*); Herthevtzian, 1986: 31 (*C. sexguttatum*); Mani, 1989: 814 (*C. quinqueguttata*); Trjapitzin, 1989: 146–147 (*C. quinqueguttata*); Noyes, Hayat, 1994: 252–255; Hayat, 2006: 264–265.

DISTRIBUTION. Portugal, Spain, Slovakia, Hungary, Croatia, Montenegro, Romania, Bulgaria, Greece, Russia (Crimea, Krasnodarskiy Kray, Orenburgskaya Oblast'), Ukraine (Odesskaya Oblast'), Moldova, Turkey, Israel, Saudi Arabia, Libya, Georgia, Armenia, Azerbaijan, Kazakhstan, Turkmenistan, Mongolia, China, Japan, Pakistan, India, Bangladesh, Sri Lanka, Thailand, Malaysia, Singapore, Indonesia, Papua New Guinea, Australia, Gambia, Burkina Faso, Ghana, Nigeria, Cameroon, Ethiopia, Uganda, Kenya [new record], Malawi, Zambia, Zimbabwe, Republic of South Africa, Madagascar.

HOSTS. *Birendracoccus saccharifolii* (Green, 1908) (Pseudococcidae) on sugarcane in India [Noyes, Hayat, 1994], *Heliococcus summervillei* Brookes, 1978, on *Paspalum dilatatum* in Australia [Summerville, 1928], and unidentified Pseudococcidae on *Cocculus trilobus* in Japan [Tachikawa, 1970].

TYPE MATERIAL EXAMINED. 2 male syntypes of *C. sexguttata* [ZMMU] on one paper rectangle labeled: 1. "des somite du mont Patannas" [on summit of Mount Patannas]; 2. [a small yellow circle]; 3. [a small rectangle] "type"; 4. [a yellow label of Motschulsky] "*Callipteroma sexguttata* Motsch. I. de Ceyl. M^{t} Pat."; 5. [a red label of V. A. Trjapitzin] "*Callipteroma sexguttata* Motschulsky, ♂♂. Syntypi"; 6. [red] "*Callipteroma sexguttata* Motschulsky, lectotypus ♂ [with undamaged right antenna], des. V. A. Trjapitzin"; 7. "*Callipteroma sexguttata* Motschulsky, ♂♂, det. V. A. Trjapitzin, 2008". The lectotype, here designated to avoid any confusion about the type specimens of this species and its identity, is the male with one undamaged antenna; the other male (the paralectotype) has undamaged wings.

4 female syntypes of *C. quinqueguttata* [ZMMU] on one paper triangle, in a very bad condition (strongly damaged), labeled: 1. [a small yellow circle]; 2. [a small rectangle] "type"; 3. [a yellow label of Motschulsky in his handwriting] "*Callipteroma quinqueguttata* Motsch."; 4. [a red label of V. A. Trjapitzin] "*Callipteroma sexguttatum* Motschulsky, ♀. Syntypi. I. of Ceyl. M^{t} Pat."; 5. [a red label of V. A. Trjapitzin] "LECTOTYPUS ♀ with undamaged wings and antennae (except apical parts)"; 6. [white] "*Callipteroma sexguttata* Motschulsky, ♀♀, det. V. A. Trjapitzin, 2008"; 7. [red] "*Callipteroma quinqueguttata* Motschulsky, ♀. Paralectotypus, des. V. A. Trjapitzin"; 8. [white] "*Callipteroma sexguttata* Motschulsky, ♀, det. V. A. Trjapitzin, 2008". The lectotype, here designated to avoid any confusion about the type specimens of this species and its identity, is the female with undamaged wings and antennae (except for their apical parts); the other females are paralectotypes.

MATERIAL EXAMINED. RUSSIA: Crimea: Karabi-Yayla, in karst craters, 3.ix.1963, V. Tanasijtshuk [1 female, ZISP]; Nikita [Botanical] Garden [1 female, SIZK]. Krasnodarskiy Kray, Fal'shivyy Gelendzhik, on grasses at seaside (limestone), 30.viii.1963, E. S. Sugonjaev [1 female, 1 male, UCRC]; Orenburgskaya Oblast', Verkhne-Dneprovka, 18.viii.1934, L. Zimin [1 female, ZISP] (determined by V. V. Gussakovsky); MOLDOVA: Kotovskoye [1 female, IBCM]; TURKEY: Mugla: Flos, 500–70 m, 27.viii.1992, J. S. Noyes [1 male, BMNH]. Fetiye, Ole Deniz, 300 m, 3.viii.1992, J. S. Noyes [1 female, BMNH]; ISRAEL: Kirjat Anawim, 3.vi.1931, S. Bodenheimer [1 male, ZMHB]; Kubeleh (near Jerusalem), 600 m, 16.vi.1958, Y. Klapperich [1 female, HNHM]; GEORGIA: Adjara, Keda, pine forest and its edge, 3.vii.1953, V.A. Trjapitzin [1 female, ZISP]; AZERBAIJAN: Nakhchivan Autonomous Republic, Dzhulfa, arsenic works, 30.v.1957, V. A. Trjapitzin [1 male, ZISP]; KAZAKHSTAN: Akmola Region, Korshetau Mountains, Boaga-Uzek River valley, sweeping gramineous grasses in steppe, 27.v.1957, V. I. Tobias [1 female, ZISP]; Karaganda Region, 40 km S of Zhana-Arka, among *Agropyrum desertorum*, 15.ix.1960, A. F. Emeljanov [1 female, ZISP]; MONGOLIA: 15 km WNW of Dzakhol, on *Nitraria* sp., 24–26.1970, E. P. Nartshuk [2 females, ZISP]; CHINA: Macao (Macau), xii.1906, F. Muir [1 female, UCRC]; JAPAN: Shikoku Island, Ehime Prefecture, Matsuyama, 3.v.1954 and 18.ix.1960 [2 females, ZISP] (identified by T. Tachikawa as *C. kiushiuensis* Ishii, 1928); INDIA: Delhi, New Delhi, Indian Agricultural Research Institute, 300 m, 8.vii.1990, J. M. Heraty [1 male, UCRC] (determined by M. Hayat); ETHIOPIA: Ambo, savannah: 17.ii.1980, V. Matsyuk [1 male, ZISP]; 14.v.1985, V. I. Pilipyuk [1 female, ZISP]; Guder, Dgafields, 17.vi.1985, V. I. Pilipyuk [1 male, ZISP]; UGANDA: Katona, ix.1913, Mujenje [1 female, MNCN]; KENYA: Kakamega County, Isecheno Nature Reserve, 0°14'24''N 34°52'12''E, 1617 m, 8.ix.2000, R. Snelling [1 male, UCRC]; Laikipia County, Mpala Research Centre, 0.29°N 36.90°E, 1680 m, 1–9.x.1999, R. Snelling [1 male, UCRC].

REMARKS. Under the name of *C. quinqueguttata*, Motschulsky [1863] described females, and under the name *C. sexguttata* – males, from the same locality. Bouèek [1977], acting as First Reviser, synonymized *C. quinqueguttata* under *C. sexguttata*. In such situation a vice versa choice would be definitely more logical and proper both nomenclaturally and taxonomically. Unfortunately, Trjapitzin [1989: 146], not being aware of that nomenclatural action by Bouèek, synonymized *C. sexguttata* under *C. quinqueguttata*. We have no choice other than accepting *C. sexguttata* as the valid name of this species.

6. *Callipteroma testacea* Motschulsky, 1863
Figs 7–8.

Calocerinella trifasciatus Girault, 1913 [correct spelling: *trifaciata*], synonymy by Noyes, 1978: 549; *Leptomastix trifasciatipennis* Girault, 1915, synonymy by Noyes, 1978: 549; *Leptomastix penangi* Girault, 1919, synonymy by Noyes, 1978: 549–550; *Leptomastix geminus* Girault, 1923 [correct spelling: *gemina*], synonymy by Noyes, 1978: 549, 551; *Leptomastidea sayadriae* Mani et Kaul, 1974, synonymy by Hayat, 1981: 17.

Motschulsky [Motschoulsky], 1863: 37–38; Girault, 1913: 47 (*Calocerinella trifasciatus*); Girault, 1915: 150 (*Leptomastix trifasciatus*), 152 (*Leptomastix trifasciatipennis*); Girault, 1919: 165 (*Leptomastix penangi*); Girault, 1923: 47 (*Leptomastix geminus*); Trjapitzin, 1965: 313–316 (*Callipteroma testaceum*); Mani & Kaul, 1974: 70–72 (*Leptomastidea sayadriae*); Noyes, 1978: 549–551; Mani, 1989: 818; Noyes & Hayat, 1994: 255–257; Dahms & Gordh, 1997: 91–92; Japoshvili & Noyes, 2005: 137; Hayat, 2006: 264–265.

DISTRIBUTION. Saudi Arabia, Pakistan, India, Bangladesh, Sri Lanka, Malaysia, Indonesia, Papua New Guinea, Australia, Gambia, Nigeria, Namibia, Zimbabwe, Republic of South Africa, Madagascar.HOSTS. *Birendracoccus saccharifolii* (Green, 1908) (Pseudococcidae) on sugarcane in India [Noyes & Hayat, 1994] and unidentified Pseudococcidae on *Cocculus trilobus* in Japan [Tachikawa, 1970].

TYPE MATERIAL EXAMINED. 1 male original syntype [ZMUM], collected on Mount Patannas, Sri Lanka, designated here as lectotype to avoid any confusion about the type specimens of this species and its identity, on a paper rectangle labeled: 1. [a small quadrate] "type"; 2. [a yellow quadrate] "*Callipteroma testacea* Motsch.".

MATERIAL EXAMINED. INDONESIA: Komodo Island, sea level, palm savannah (*Borassus*), by sweeping *Imperata cylindrica* (Poaceae), 5.viii.1962, I. S. Darevsky [1 female, ZISP]. Padar

Island, dry slopes of a gorge, by sweeping *Imperata cylindrica*, 13.viii.1962, I. S. Darevsky [1 male, ZISP]; PAPUA NEW GUINEA: Central Province: 15 km SE of Port Moresby, 1.i.1986, *Eucalyptus* grassland, G. Gordh [1 male, UCRC]; Ca. 30 km E of Port Moresby (near Uariaraka), 28.xii.1985, *Eucalyptus* grassland, G. Gordh [1 male, UCRC]; AUSTRALIA: Northern Territory, 58 km SE of Adelaide River, 28.iii.1991, J. D. Pinto [1 female, UCRC]. Queensland: Brisbane, Acacia Ridge: 27.ix.1980, E. Dahms, G. Gordh [2 females, UCRC]; Calam Rd., 31.viii.1980, G. Gordh, E. Dahms [1 male, UCRC]; 9.3 km N of Ellis Beach, 50 m, on kangaroo grass, 30.iv.1990, J. M. Heraty [1 female, UCRC]; Gatton, 10–11.ix.1980, G. Gordh, E. Dahms [2 females, 1 male, UCRC].

REMARKS. On fig. 5 in Trjapitzin [1965: 315], female fore wing of *C. testacea* looks too long. That was due to an imperfection of the drawing apparatus used then.

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