

## The members of the subgenus *Semenowia* Weise, 1889 of the genus *Chrysolina* Motschulsky, 1860 (Coleoptera: Chrysomelidae)

### Состав подрода *Semenowia* Weise, 1889 рода *Chrysolina* Motschulsky, 1860 (Coleoptera: Chrysomelidae)

A.O. Bieńkowski  
А.О. Беньковский

A.N. Severtsov Institute of Ecology and Evolution, Russian Academy of Sciences, Leninsky pr., 33, Moscow 119071 Russia. E-mail: bienkowski@yandex.ru

Институт проблем экологии и эволюции им. А.Н. Северцова Российской академии наук, Ленинский пр., 33, Москва 119071 Россия

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**Ключевые слова:** Coleoptera, Chrysomelidae, *Chrysolina*, *Semenowia*, систематика.

**Abstract.** Species of the subgenus *Semenowia* of the genus *Chrysolina* differ from each other in a number of diagnostic characters, so it is not a natural group. Only the type species, *Ch. (S.) chalcea* should be regarded as a member of this subgenus. Subgenus *Ch. (Semenowia)* is close to the subgenus *Ch. (Pezocrosita)* Jacobson, 1901 and differs from the latter in the presence of seven rows of punctures on elytron. *Ch. (S.) freyensis* belongs to the species group *Ch. (obovata)* of the subgenus *Ch. (Pezocrosita)*. It has the following characters of this group: shape of aedeagus (medial lobe is drawn out and curved upwards), narrow lateral furrow at pronotal base, and puncturation of elytron (fine punctures forming rows are connected with fine longitudinal wrinkles). Other species occupy uncertain position within the genus. *Ch. nagaja* and *Ch. daccordii* represent a natural group, which is close to the subgenus *Ch. (Timarcholina)* and differs from the latter in smaller body and absence of the denticles on the fourth tarsomere. *Ch. mirabilis* forms a natural group with *Ch. davidiani*, *Ch. luyoui* and *Ch. sicienti*. The distinctive features of this group are dorsal colour (shining, green with purple stripes), broad pronotal lateral impressions, elytra with irregular rows of very fine, obsolete punctures, and enlarged protarsomere 1 in male.

**Резюме.** Виды подрода *Semenowia* рода *Chrysolina* различаются по многим диагностическим признакам и не образуют естественной группы. В составе подрода следует рассматривать только типовой вид *Ch. (S.) chalcea*. Подрод *Ch. (Semenowia)* близок к подроду *Ch. (Pezocrosita)*, от которого отличается наличием семи точечных рядов на надкрылье. *Ch. (S.) freyensis* относится к группе видов *Ch. (obovata)* в составе подрода *Ch. (Pezocrosita)* благодаря форме эдегуса (оттянутая средняя лопасть, у вершины отогнутая вверх), узкой боковой бороздке у основания переднеспинки и пунктировке надкрылий (точки в рядах мелкие, соединены продольными морщинками). Остальные виды занимают неопределенное положение в составе рода. *Ch. nagaja* и *Ch. daccordii* образуют естественную группу, близкую к подроду *Ch. (Timarcholina)*, от которого отличаются меньшей величиной и отсутствием зубчиков на коготковом

членике лапок. *Ch. mirabilis* вместе с *Ch. davidiani*, *Ch. luyoui* и *Ch. sicienti* образуют естественную группу, которая характеризуется окраской верха (блестящая зеленая с пурпурными полосами), широкими боковыми вдавлениями переднеспинки, слабо упорядоченной и очень мелкой пунктировкой надкрылий и расширенным первым члеником передних лапок у самца.

This article is dedicated to the memory of Igor Konstantinovich Lopatin, who made a great contribution in the study of the genus *Chrysolina* of the Middle Asia, Kazakhstan, and China.

### Introduction

The genus *Semenowia* Weise, 1889 was originally described for the single species, *S. chalcea* Weise, 1889 from China (Tibet Autonomous Region). Weise [1889] in the original description paid attention on the absence of the setae on elytral epipleura as a distinctive feature of the genus. Because of that, *Semenowia*, which shares many diagnostic characters with *Chrysolina* Motschulsky, 1860, was placed into the tribe Timarchini close to *Potaninia* Weise, 1889 and *Entomoscelis* Chevrolat, 1843 [Weise, 1916]. Gressitt, Kimoto [1963] included *Semenowia* in the key to Chinese Chrysomelinae on the base of the literature data only. They erroneously thought that *Semenowia* has closed anterior coxal cavities. Daccordi [1976] reexamined a type specimen of *S. chalcea* and pointed out that this species has opened anterior coxal cavities. Because of that, Daccordi [1976] and Seeno, Wilcox [1982] believed *Semenowia* to be the member of the tribe Chrysomelini.

Four more new species, namely *S. freyi* Daccordi, 1976 and *S. mirabilis* Daccordi, 1976 from China (Sichuan), *S. nagaja* Daccordi, 1982 from Pakistan (later found also in Nepal), and *S. daccordii* L. Medvedev et Sprecher-Uebersax, 1999 from Nepal [Daccordi, 1976, 1982; Medvedev, Sprecher-Uebersax, 1999] were included in the genus *Semenowia* later. The absence of setae on the elytral epipleura was probably of decisive importance for inclusion of these species in the genus *Semenowia*.

Daccordi [1994] indicated that the absence of setae on

elytral epipleura takes place in several unrelated members of *Chrysolina*, and therefore included *Semenowia* as a subgenus in the genus *Chrysolina*. As a result, the name *Ch. (Semenowia) freyi* Daccordi, 1976 was replaced to *Ch. (Semenowia) freyensis* Kippenberg, 2010 owing to the secondary homonymy with *Ch. freyi* Bechyné, 1950 [Kippenberg, 2010].

Depositions of the material examined:

BC – the author's collection, Zelenograd, Russia;

MC – Dr. L.N. Medvedev collection, Moscow, Russia;

MTD – Museum für Tierkunde Dresden, Germany;

ZMHB – Museum für Naturkunde der Humboldt-Universität, Berlin, Germany.

**Material.** *Chrysolina chalcea*: syntype *Semenowia chalcea* with labels: "Amdo. 1886 G.Patanin", "Semenowia chalcitis Ws.", 1♂ (ZMHB); topotype with label: "Amdo. 1886 G.Patanin", 1♂ (MC); other specimens: China: Gansu, Qilian Shan S. Zhangye, 20 km SSW of Huazhaizi, 2900–3400 m, 25.07.1999, I.A. Belousov, I.I. Kabak leg., 2♀ (BC).

*Ch. freyensis*: paratype *Semenowia freyi* with labels: "W. Szechuan, China Sankiangkou leg. Friedrich", "Selong 4000 m 7.-8.1934 Wassuland", "PARATYPUS" [red], "Semenowia freyi n.sp. det. Daccordi 74", 1♂ (MC).

*Ch. mirabilis*: China: Sichuan, Jitiang, 3–14.07.2001, E. Kucera leg., compared with the type by the author, Dr. M. Daccordi, 1♀ (BC).

*Ch. nagaja*: Nepal: Taplejung Distr., Anda Deorali between Simbua and Gansa Khola, 4490 m, 9.09.1983, J. Martens, B. Daams leg., 1♂ (MC).

*Ch. daccordii*: topotype *S. daccordii*: Nepal: Annapurna Mts., Namun pass, S. slope, N. bank of Myardi Khola, 4200 m, 18.08.1995, Fabrizi, Schmidt, Jäger leg., 1♂ (MTD); other specimens: Annapurna Mts., Taunja Danda, E. slope, 3900 m, 11–12.08.1995, Jäger leg., 1♂; Nepal: SW Ganesh Himalaya, N. Mangeythanti, Bhanjyang, Abuthum lekh, 3600–4000 m, 19–20.05.1996, Bulik, Kulke, Ahrens leg., 1♀ (BC).

## Results and discussion

I examined the specimens of *Ch. (S.) chalcea* (Fig. 1–6) and found the opened anterior coxal cavities. It supports the view of Dr. M. Daccordi. Besides that, I found very fine and not numerous setae on the inner border of elytral epipleura near the elytral apex (Fig. 6). These setae are easily observable at 56 X magnification. They went unnoticed before, especially at low magnification. I also found such setae in *Ch. (S.) freyensis* and *Ch. (S.) mirabilis*. However, *Ch. (S.) nagaja* and *Ch. (S.) daccordii* devoid of them.

The reduction of the number and shortening of the epipleural setae takes place in different subgenera, for example, in *Ch. (Anopachys) asclepiadis* (Villa, 1833), *Ch. (Anopachys) lineigera* (Jacobson, 1901), *Ch. (Arctolina) ballioni* (Lopatin, 1968). Epipleural setae are absent in *Ch. (Anopachys) eurina* (Frivaldszky, 1883) and *Ch. (Timarchida) deubeli* (Ganglbauer, 1897).

I found only few diagnostic characters which are common to all members of the subgenus *Ch. (Semenowia)*, namely, a reduction of hind wings and humeral calli, absence of the furrow on pygidium, and presence of sutural furrow on the elytral apical slope. However, such combination of characters is insufficient to place the species into the same subgenus because this combination occurs widely in *Chrysolina*. On the other hand, a number of features, using in the classification of the genus in question [Bieńkowski, 2011], differs in *Ch. (Semenowia) chalcea* and other species (Table 1).

Therefore, I consider *Ch. (Semenowia)* as a monotypic subgenus which includes *Ch. (S.) chalcea* only. This

subgenus is close to the subgenus *Ch. (Pezocrosita) Jacobson*, 1901), and differs in the presence of seven elytral puncture rows. This character was already mentioned by Weise [1889]. A modern redescription of *Ch. (Semenowia) chalcea* was published before [Bieńkowski, 2008]. Other species of the former subgenus *Ch. (Semenowia)* occupy different positions within the genus. I abstain from the establishment of new subgenera to include these species because the fauna of *Chrysolina* of China, Nepal, and Pakistan is studied very incompletely, and infrageneric system has not been developed yet. A number of the new *Chrysolina* species was recently described from this region without including in any subgenus [for example, Lopatin, 1998, 2000, 2002, 2004, 2005a, 2005b, 2006, 2007, 2008; Daccordi et al., 2011].

In my opinion, *Ch. mirabilis* (Fig. 7) forms a natural group with *Ch. davidiani* Lopatin, 2002, *Ch. luyoui* Daccordi et Ge, 2011, and *Ch. sicienti* Ge et Yang, 2011. The distinctive features of this group are dorsal colour (shining, green with purple stripes), broad pronotal lateral impressions, elytra with irregular rows of very fine, obsolete punctures. A male of *Ch. mirabilis* is still unknown to the science. Other members of this group are characterized by enlarged protarsomere 1 in male [Lopatin, 2002; Daccordi et al., 2011].

*Ch. nagaja* and *Ch. daccordii* (Fig. 8–11, 12–16) represent a natural group, which is close to the subgenus *Ch. (Timarcholina) Bechyné*, 1950) from India and Sri Lanka, and differs from it in smaller body and absence of the denticles on the fourth tarsomere.

I transfer *Ch. freyensis* (Fig. 17–20) into the species group *Ch. (obovata) Jacobson*, 1895 [in Bieńkowski, 2007 sense] of the subgenus *Ch. (Pezocrosita)* on the base of the shape of male aedeagus (medial lobe is drawn out and curved upwards), narrow lateral furrow at pronotal base, and puncturation of elytron (fine punctures forming rows are connected with fine longitudinal wrinkles as in *Ch. kiritshenkoi* (Lopatin, 1970)). The members of *Ch. (obovata)* group inhabit mountains of Central Asia and China.

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Table 1. Diagnostic characters of the species.  
Таблица 1. Диагностические признаки видов.

Characters / признаки		<i>Ch. chalcea</i>	<i>Ch. freyensis</i>	<i>Ch. mirabilis</i>	<i>Ch. nagaja</i>	<i>Ch. daccordii</i>
Maxillar palpus in male / Челюстной щупик самца	Broadened apical joint / Расширенный верхинный членик	+	-	?	-	-
Pronotum / переднеспинка	Lateral furrow at base / Боковая бороздка у основания	+	+	+	-	-
	Broad lateral impression anteriorly / Широкое боковое вдавление впереди	+	+	+	-	-
	Setae at anterior border / Щетинки на переднем крае	+	+	-	+	+
Propleura / Проплевра	Lateral impression / Боковое вдавление	-	-	+	-	-
	Basal fold / Складка у основания	-	-	-	+	-
Prosternum / Стернит переднегруди	Ridge on anterolateral portion / Киль на передне-боковой части	+	-	-	-	-
Elytron / Надкрылье	Puncture rows / Ряды точек	7 rows / 7 рядов	9 rows / 9 рядов	-	-	-
	Epileural setae / Щетинки на эпиплеврах	+	+	+	-	-
Broadened protarsomere I in male / Расширенный 1-й членик передней лапки самца		+	-	?	-	-
Green with purple stripes dorsal colouration / Зеленая с пурпурными полосами окраска верха		-	-	+	-	-

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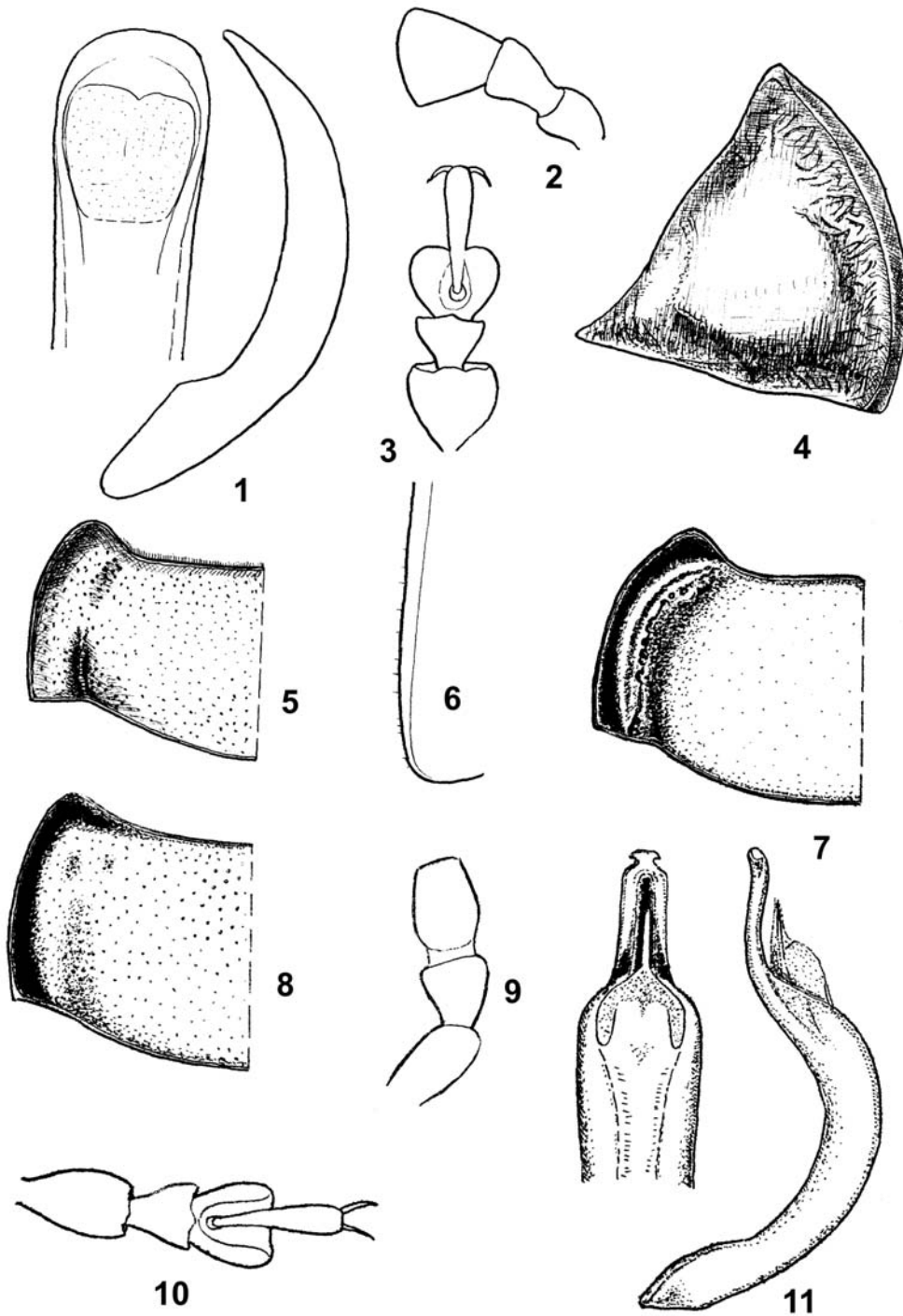


Fig. 1–11. *Chrysolina*, structural details.

1–6 – *Ch. chalcea* (Weise, 1889) (syntype *Semenowia chalcea*), male: 1 – aedeagus, dorsal and lateral view, 2 – maxillary palpus, 3 – fore tarsus, 4 – propleura, 5 – pronotum, 6 – apex of elytron, lateral view; 7 – *Ch. mirabilis* (Daccordi, 1976), female, pronotum; 8–11 – *Ch. daccordii* (L. Medvedev et Sprecher-Uebersax, 1999) (topotype *S. daccordii*), male: 8 – pronotum, 9 – maxillary palpus, 10 – fore tarsus, 11 – aedeagus, dorsal and lateral view.

Рис. 1–11. *Chrysolina*, детали строения.

1–6 – *Ch. chalcea* (Weise, 1889) (синтип *Semenowia chalcea*), самец: 1 – эдеагус сверху и сбоку, 2 – челюстной щупик, 3 – передняя лапка, 4 – проплевра, 5 – переднеспинка, 6 – вершина надкрылья сбоку; 7 – *Ch. mirabilis* (Daccordi, 1976), самка, переднеспинка; 8–11 – *Ch. daccordii* (L. Medvedev et Sprecher-Uebersax, 1999) (топотип *S. daccordii*), самец: 8 – переднеспинка, 9 – челюстной щупик, 10 – передняя лапка, 11 – эдеагус сверху и сбоку.



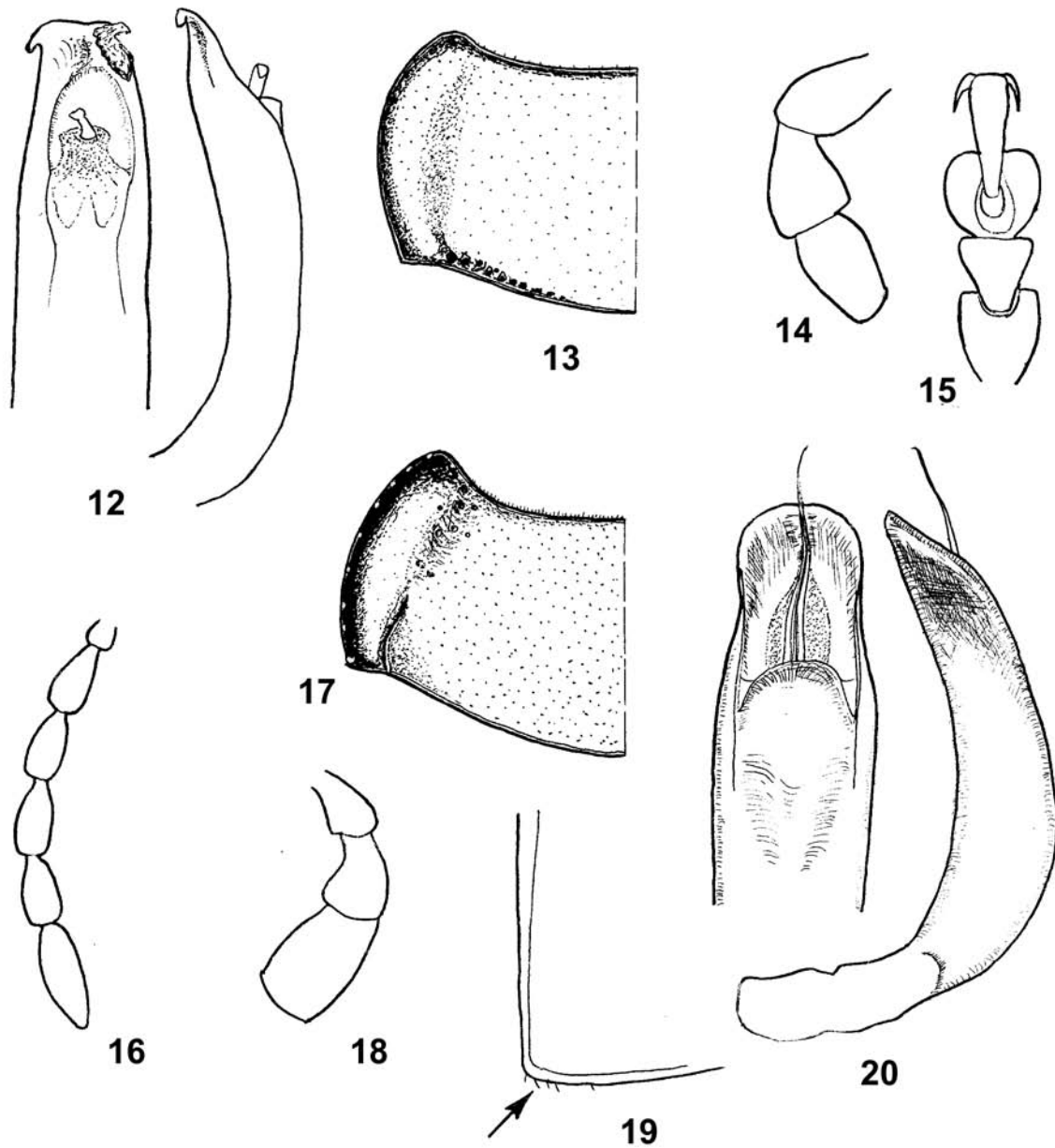


Fig. 12–20. *Chrysolina*, structural details.

12–16 – *Ch. nagaja* (Daccordi, 1982), male: 12 – aedeagus, dorsal and lateral view (apex damaged), 13 – pronotum, 14 – maxillary palpus, 15 – fore tarsus, 16 – apex of antenna; 17–20 – *Ch. freyensis* Kippenberg, 2010 (paratype *Semenowia freyi* Daccordi, 1976), male: 17 – pronotum, 18 – maxillary palpus, 19 – apex of elytron, hind view, 20 – aedeagus, dorsal and lateral view.

Рис. 12–20. *Chrysolina*, детали строения.

12–16 – *Ch. nagaja* (Дассорди, 1982), самец: 12 – эдеагус сверху и сбоку (вершина повреждена), 13 – переднеспинка, 14 – челюстной щупик, 15 – передняя лапка, 16 – вершина усика; 17–20 – *Ch. freyensis* Киппенберг, 2010 (паратип *Semenowia freyi* Дассорди, 1976), самец: 17 – переднеспинка, 18 – челюстной щупик, 19 – вершина надкрылья сзади, 20 – эдеагус сверху и сбоку.

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