

A review of the Palaearctic species of the subgenus *Catonebria* SHILENKOV (Coleoptera, Carabidae, *Nebria*)

1. *Nebria mellyi* GEBLER group

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Summary

A taxonomic revision of species close to *Nebria mellyi* GEBLER is presented; 5 species and 8 subspecies found in the Altai-Sayan mountains are included in this group. 3 new species and 8 new subspecies are described: *Nebria sajana* sp. n., *N. sajana lomakini* ssp. n., *N. sajana sarlyk* ssp. n., *N. sajana dubatolovi* ssp. n., *N. sajana sitnikovi* ssp. n., *N. arinae* sp. n., *N. arinae zinchenkoi* ssp. n., *N. roddei* sp. n., *N. baenningeri korgonica* ssp. n., *N. baenningeri katunensis* ssp. n. *Nebria baenningeri* nom. nov. is proposed for *N. escheri* MOTSCHULSKY, 1844 (praecoc.). A key for species and subspecies of the *Nebria mellyi* group and some ecological and zoogeographical notes are provided.

Key words: Carabidae, *Nebria*, *Catonebria*, new species, new subspecies, Altai, Western Sayan, Kuznetskij Alatau

Introduction

The present paper is based principally on a study of the authors' collections as well as those of Museums and some private persons:

ZISP – Zoological Institute, Russian Academy of Sciences, St. Petersburg, Russia.

SZMN – Siberian Zoological Museum, Institute of Animal Systematics and Ecology, Siberian branch of Russian Academy of Sciences, Novosibirsk, Russia.

KBIN – Koninklijk Belgisch Instituut voor Natuurwetenschappen, Brussel, Belgium.

ISU – Irkutsk State University, Russia.

ZMUM – Zoological Museum of Moscow State University (collection of V.I. Motschulsky), Russia.

MPU – Pedagogical University of Moscow, Russia.

CB – collection of I.A. Belousov, St. Petersburg, Russia.

CCH – collection of A.N. Chemeris, Tomsk, Russia.

CF – collection of D.N. Fedorenko, Moscow, Russia.

Investigation of represented material (above two thousand specimens) of *Nebria mellyi* has shown that several species were mixed under this name. A taxonomic review of the species established the *N. mellyi* group in the subgenus *Catonebria* SHILENKOV.

Methods

Completely extruded inner sacs of aedeagi (endophalli) of all species and subspecies of *N. mellyi* group were

studied. All samples were prepared according to the methods given below.

Beetles poisoned with ethylacetate are more useful for endophallic preparation. Genitalia were extracted from soaked specimens by means of entomological pins. Penises were separated from parameres and accordingly macerated in hot (C. 90° C) 10% KOH and 10% acetic acid during 3 to 5 minutes (old specimens and beetles, not poisoned with ethylacetate are macerated for 10 to 15 minutes) and then washed with hot water.

For extruding the inner sac, a syringe with a needle diameter somewhat smaller than the aedeagus base was used. The needle was put in aedeagus base to C. 0.5 mm depth and closely swathed with Parafilm. Water was carefully pumped into endophallus until it was inflated. It is important to note that the syringe should be filled with air and a small quantity of water to prevent rupturing of the endophallus. Extracted structures were dried with air under a warm lamp. The Parafilm was removed by means of a pin and the aedeagus glued on paper.

Sometimes is impossible to invert inner structures from the aedeagus of "non-ethylacetate" specimens or membranous parts of sacs are not clearly extruded, and some bulbs are indistinct. Usually an inverted endophallus can be positioned at different angles to the body axis, so all measurements and figures are made in the endophallus plain.

For the morphological description, the following characters and abbreviations were used and measurements were made: width of head (WH), pronotum (WP) and elytra (WE) measured at the widest part; width of pronotum base (WB) – between the hind angles; pronotum length (LP) – on the median line; elytra length (LE) – from scutellum tip to elytra apex; antenna length (LAN) – from the base of the second segment to the tip of the apical segment; body length (LBODY) – from the tip of the mandibulae to elytra apex.

Subgenus *Catonebria* SHILENKOV, 1975

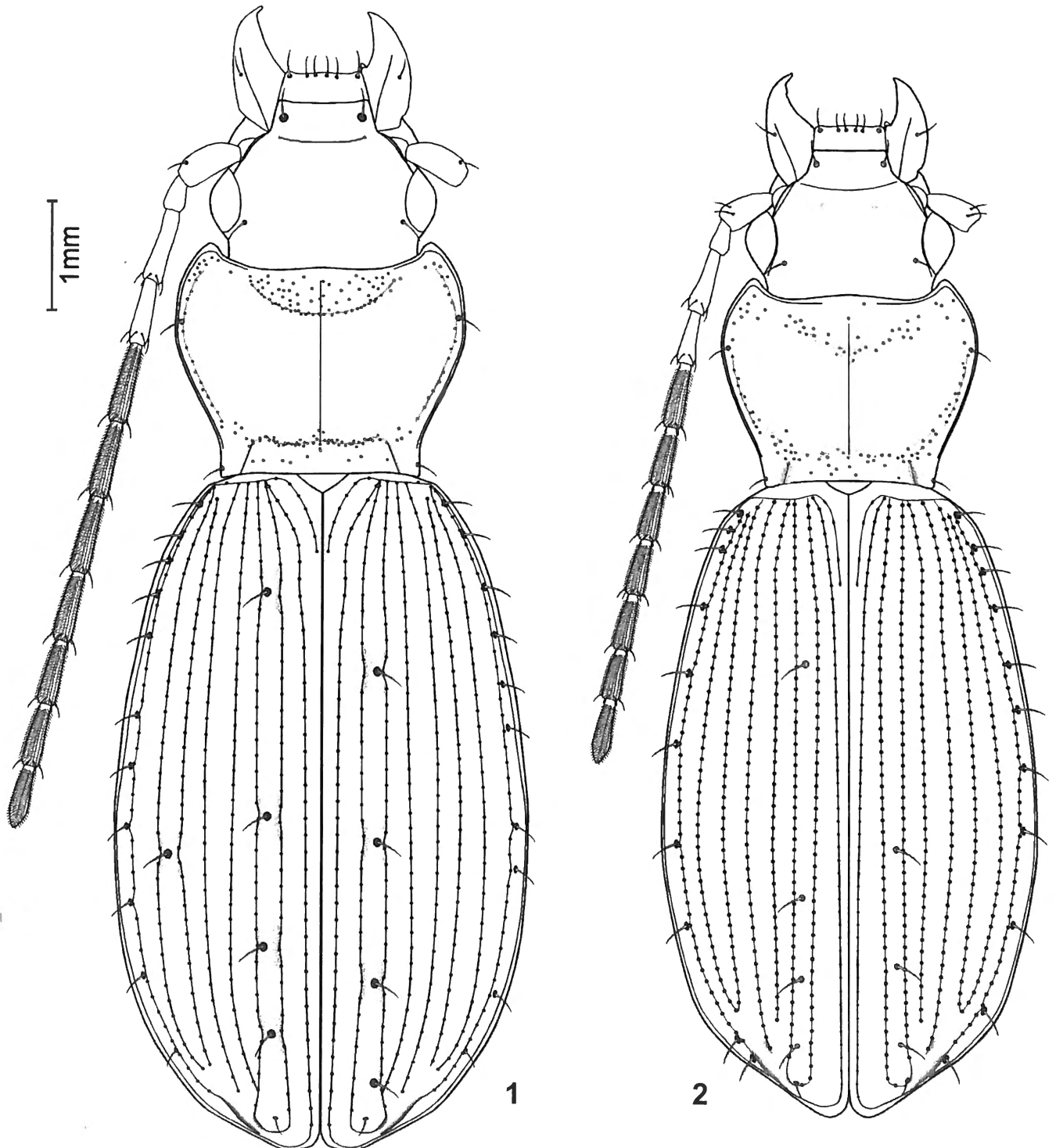
At present, 9 Palaearctic *Nebria* species found in the mountains of South-Eastern and Eastern Kazakhstan,

Russia (Southern and Eastern Siberia, the Russian Far East), Mongolia, North-Eastern China, Northern Korea (SHILENKOV, 1975, 1976, 1983; KRYZHANOVSKIY & al., 1995; KAVANAUGH & SHILENKOV, 1996) belong to the subgenus *Catonebria*: *N. catenulata* FISCH., *N. aenea* GEBLER, *N. fulgida* GEBLER, *N. mellyi* GEBLER, *N. sajana* sp. n., *N. baenningeri* nom. nov., *N. arinae* sp. n., *N. roddei* sp. n. and *N. scaphelytra* KAVANAUGH & SHILENKOV.

Diagnosis. Vertex with a pair of paramedial red spots,

labial palpus with penultimate palpomere trisetose, pronotum with a midlateral seta, elytral discal setiferous punctures broadly foveate, elytral interval 3 (and usually intervals 5, 7) with two to nine setiferous pores, abdominal sternites 3-5 each with two or more pairs of posterior paramedial setae, abdominal sternite 6 with 2-4 pairs of apical setae in both sexes, metasternum smooth or very faintly punctured, male median lobe broad.

Subgenus *Reductonebria* SHILENKOV, 1975 is the closest to *Catonebria*. It differs by the following characters:



Figs. 1-2 — Habitus of *Nebria* spp.

1 - *N. mellyi mellyi* GEBLER, Teren'-Kazyr Mt. Range; 2 - *N. roddei* sp. n.

midlateral pronotal seta lacking; elytral discal setiferous punctures small and usually set in interval 3; abdominal sternite 6 with only one pair of apical setae in males and with two pairs in females.

Subgenus *Pseudonebriola* was described by LEDOUX & ROUX in 1989 with *Nebria saurica* SHILENKOV as the type species. The authors also placed *N. mellyi* GEBLER in this subgenus mainly due to the absence of pores in elytral intervals 7 and 5. In fact, about 40% of *N. mellyi* specimens possess 1 to 3 pores in interval 7 and sometimes in interval 5. Moreover, *N. saurica* and closely related species have the following strong characters which distinguishes them from *N. mellyi* and the subgenus *Catonebria*: vertex without a pair of paramedial red spots, elytral discal setiferous punctures small and found only in interval 3, each abdominal sternites 3 to 5 with one or two pairs of posterior paramedial setae, abdominal sternite 6 with 1 pair of apical setae in males and 2 pairs in females, male median lobe thin. These characters show a close relationship between the subgenera *Pseudonebriola* and *Boreonebria*, proving that *N. mellyi* was wrongly placed in *Pseudonebriola*.

We divide Palearctic species of *Catonebria* into 3 groups. The relationship of these species with Nearctic ones is not considered in this work. The first, the *N. mellyi* group consists of the following species: *N. mellyi* GEBLER, *N. sajana* sp. n., *N. baenningeri* nom. nov., *N. arinae* sp. n., *N. roddi* sp. n., and can be distinguished by the following characters: body black, piceous or dark brown, without metallic reflection (excepting *N. baenningeri* nom. nov.); humeri markedly rounded; elytral interval 7 and 5 without or with one to three setiferous pores; prosternal intercoxal process with margination only in basal half; aedeagus weakly curved ventrally; the tip in 1/6 or 1/8 of aedeagus length distinctly curved (in lateral aspect).

The second, *N. catenulata* FISCH. group consists of the following species: *N. catenulata* FISCH., *N. fulgida* GEBL. and *N. aenea* GEBL. This group is characterised by the following: upper surface with marked metallic reflection (excepting some very rare melanistic specimens of *N. fulgida* GEBL.); humeri distinctly prominent; elytral interval 7 and 5 usually with four to eight (the only *N. aenea* GEBL. with one to four) setiferous pores; prosternal intercoxal process completely or most completely marginate (but *N. fulgida* GEBL. in which it is marginate only in basal part); aedeagus strongly curved ventrally; if the tip distinctly curved, so in 1/4 of aedeagus length (in lateral aspect).

The third group is represented by the species *N. scaphelytra* KAVANAUGH & SHILENKOV, and defined by characters close to *N. mellyi* GEBL. as well as to *N. catenulata* FISCH. group: upper surface without metallic reflection, humeri markedly rounded, elytral interval 7 and 5 with four to five setiferous pores, prosternal intercoxal process completely marginate, aedeagus strongly curved ventrally; the tip distinctly curved in 1/4 of aedeagus length (in lateral aspect). Besides, basolateral setae of pronotum lacking in *N. scaphelytra* which differs this species from

the other Palearctic species of subgenus *Catonebria*.

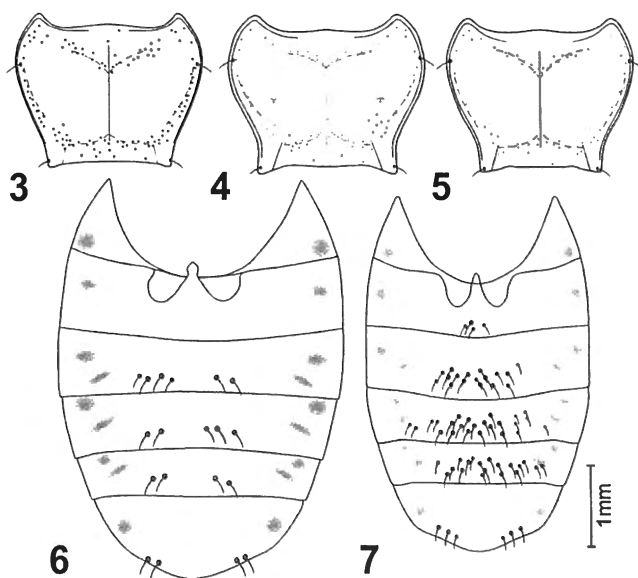
Nebria mellyi group

DESCRIPTION

Body of moderate size (8.2-12.3 mm) (Figs 1, 2). Colour of body black, piceous or dark brown, only in *N. baenningeri* nom. nov. has the upper surface a slight to distinct bluish, violet or greenish metallic reflection or lack it. Vertex with a pair of paramedial red spots. Coloration of legs varying from light-red to black; in specimens with dark legs, tarsi lighter than tibiae.

Head slightly widened, eyes convex, WP/WH = 1.18-1.37 (1.28), frontal furrows small, antennae long and slender, almost reaching the middle of elytra (but in *N. arinae* sp. n. they pass through the middle); scape elongate and slightly widened anteriorly, with one or sometimes two subapical setae. Penultimate palpomere trisetose. Mentum with medial tooth rounded or emarginate, half the length of the lateral lobes, possess two pairs of setae, apical and subbasal. Submentum with transverse row of 8 to 10 setae.

Pronotum cordate (Figs. 3-5), WP/WB = 1.30-1.62 (1.46), WP/LP = 1.35-1.61 (1.45), markedly sinuate near the acute hind angles, anterior angles distinctly protrudent and rounded, apical and basal transverse impressions strong; basal foveae deep. Middle line always distinctly concavate, lateral reflection narrow, weakly widening near the angles. Peripheral part of surface of the pronotum



Figs. 3-7 — *Nebria* spp.
3-5 - Pronotum, dorsal aspect: *N. roddi* sp. n. (3); *N. banningeri banningeri* nom. nov., Kholzun Mt. Range (4); *N. arinae arinae* ssp. n., Kholzun Mt. Range (5). 6, 7 - Abdomen, ventral aspect: *N. mellyi mellyi* GEBLER, Teren'-Kazyr Mt. Range (6); *N. roddi* sp. n. (7).

finely punctulate or almost smoothed, but in *N. roddi* sp. n. it is punctate.

Elytra elongate, suboval, slightly expanded posteriorly with the maximal width at about the apical third, LE/WE = 1.44-1.64 (1.53), LE/WP = 2.04-2.52 (2.32). Humeri rounded. Basal margin from almost straight to distinctly sinuate, jointed with lateral margin arcually or at markedly obtuse angle. Furrows deep, distinctly punctate; intervals more or less elevate. Interval 3 with 2 to 6 discal pores, usually deep and separating the interval, sometimes pores are small and disposed in middle of the interval or near the third furrow. As a rule, interval 5 is poreless, rarely with 1 or 2 pores. Interval 7 poreless or with 1 to 4 pores. Subapical carina distinct, apices of elytra separately rounded.

Underside smooth, sometimes with single punctures on posterior part of prosternum and mesosternum; sternites with oblique impressions on sides. Base of hind coxa with 2 to 4 setae. Chaetotaxy of abdomen is specific. Abdominal sternites 3 to 5 with transverse row of 4 to 9 setae or with 2 or 3 irregular rows with 11 to 25 setae (Figs. 6, 7). Normally, anal sternite possesses 4 setae in male and 6 in

female. Intercostal process of prothorax marginates in basal part. Metasternum is 1.5 times longer than wide.

Legs long and slender, penultimate tarsomere with a distinct process; basal three tarsomeres in anterior legs of males distinctly widened, longitudinal, with adhesive setae on pedal part.

Microsculpture on head and disc of pronotum very fine, smoothed on vertex; on elytra rougher and being mesh-like.

Females, larger than males on average, have approximately large elytra and short antennae (Table 1).

MALE GENITALIA

Aedeagus (Figs. 22-35) large and wide, extremely narrowed at apex and weakly curved, sometimes with a slight extrusion on ventral side just before the tip. Base wide, lamella short and rounded at the tip (Figs. 36-74), preputial area disposed on right side. In some species, longitudinal impression is on basal half of right side of aedeagus (arrowed in Figs. 22-24, 31-35).

Completely extruded inner sac of aedeagus (endophal-

Table 1. Morphometrical characters of *Nebria mellyi* group.

species, subspecies	sex	N	WP/WH	WP/WB	WP/LP	LE/WE	LE/WP	LAN/WB	LBODY (mm)
<i>mellyi</i> ssp.	m	16	1.24-1.32 (1.28)	1.42-1.52 (1.45)	1.36-1.47 (1.45)	1.49-1.60 (1.56)	2.19-2.45 (2.32)	3.21-3.97 (3.47)	9.6-10.6 (10.3)
<i>mellyi</i>	f	10	1.29-1.33 (1.31)	1.44-1.53 (1.49)	1.38-1.49 (1.44)	1.51-1.58 (1.56)	2.26-2.42 (2.35)	3.16-3.44 (3.19)	9.5-11.0 (10.6)
<i>mellyi</i> ssp.	m	13	1.24-1.31 (1.28)	1.37-1.48 (1.46)	1.37-1.55 (1.46)	1.51-1.64 (1.58)	2.22-2.40 (2.29)	3.03-3.39 (3.31)	9.0-10.8 (9.6)
<i>teletskiana</i>	f	6	1.23-1.32 (1.28)	1.41-1.53 (1.49)	1.41-1.53 (1.47)	1.58-1.63 (1.61)	2.25-2.48 (2.33)	3.11-3.14 (3.13)	9.5-11.0 (10.4)
<i>sajana</i> ssp.	m	16	1.18-1.35 (1.27)	1.36-1.56 (1.48)	1.36-1.61 (1.44)	1.48-1.62 (1.53)	2.04-2.44 (2.27)	-	8.8-10.0 (9.2)
<i>sajana</i>	f	10	1.23-1.32 (1.28)	1.38-1.55 (1.48)	1.34-1.52 (1.46)	1.49-1.63 (1.58)	2.30-2.49 (2.35)	-	9.2-10.9 (10.0)
<i>sajana</i> ssp.	m	13	1.24-1.29 (1.27)	1.42-1.53 (1.48)	1.39-1.48 (1.45)	1.46-1.51 (1.49)	2.23-2.33 (2.27)	-	8.8-9.9 (9.4)
<i>lomakini</i>	f	7	1.24-1.31 (1.28)	1.44-1.49 (1.47)	1.42-1.49 (1.45)	1.49-1.53 (1.51)	2.30-2.39 (2.35)	-	9.8-10.4 (10.1)
<i>sajana</i> ssp.	m	4	1.20-1.24 (1.22)	1.44-1.48 (1.46)	1.39-1.44 (1.41)	1.51-1.62 (1.55)	2.33-2.44 (2.38)	3.75	9.7-10.1 (9.9)
<i>sarlyk</i>	f	6	1.21-1.28 (1.23)	1.34-1.48 (1.43)	1.42-1.45 (1.43)	1.49-1.57 (1.54)	2.36-2.52 (2.44)	-	10.2-11.4 (10.8)
<i>sajana</i> ssp.	m	12	1.22-1.33 (1.27)	1.38-1.56 (1.45)	1.33-1.48 (1.43)	1.51-1.63 (1.56)	2.28-2.50 (2.34)	3.00-3.42 (3.18)	9.0-10.9 (9.8)
<i>dubatolovi</i>	f	7	1.26-1.31 (1.28)	1.41-1.47 (1.44)	1.37-1.43 (1.40)	1.53-1.62 (1.57)	2.31-2.44 (2.39)	3.11-3.14 (3.13)	9.6-10.5 (10.0)
<i>sajana</i> ssp.	m	3	1.26-1.28 (1.27)	1.40-1.52 (1.45)	1.40-1.43 (1.42)	1.49-1.58 (1.54)	2.26-2.39 (2.33)	3.23-3.58 (3.40)	8.5-10.0 (9.5)
<i>sitnikovi</i>	f	3	1.29-1.33 (1.31)	1.44-1.56 (1.50)	1.41-1.47 (1.44)	1.55-1.63 (1.59)	2.34-2.43 (2.38)	3.15	10.1-10.5 (10.3)
<i>arinae</i> ssp.	m	17	1.23-1.31 (1.26)	1.42-1.53 (1.47)	1.35-1.45 (1.40)	1.48-1.59 (1.53)	2.24-2.46 (2.36)	3.74-4.13 (3.92)	9.1-10.8 (10.1)
<i>arinae</i>	f	5	1.23-1.29 (1.25)	1.44-1.49 (1.47)	1.36-1.43 (1.39)	1.49-1.55 (1.53)	2.30-2.47 (2.40)	3.50-3.79 (3.66)	10.0-10.8 (10.5)
<i>arinae</i> ssp.	m	5	1.24-1.30 (1.28)	1.41-1.46 (1.43)	1.35-1.47 (1.42)	1.51-1.56 (1.53)	2.29-2.42 (2.36)	3.85-3.97 (3.91)	9.0-9.7 (9.4)
<i>zinchenkoi</i>	f	1	1.26	1.50	1.46	1.51	2.40	3.94	9.9
<i>roddi</i>	m	13	1.27-1.32 (1.29)	1.42-1.53 (1.48)	1.39-1.50 (1.44)	1.50-1.55 (1.52)	2.28-2.42 (2.34)	3.03-3.37 (3.18)	8.5-9.2 (8.9)
	f	12	1.26-1.33 (1.29)	1.43-1.60 (1.50)	1.38-1.50 (1.44)	1.49-1.59 (1.54)	2.35-2.52 (2.44)	2.94-3.24 (3.11)	8.9-9.7 (9.4)
<i>banningeri</i> ssp.	m	28	1.21-1.36 (1.27)	1.30-1.53 (1.43)	1.42-1.56 (1.47)	1.46-1.58 (1.52)	2.08-2.31 (2.23)	2.76-3.28 (3.01)	8.2-11.8 (9.9)
<i>banningeri</i>	f	13	1.24-1.37 (1.29)	1.37-1.49 (1.43)	1.41-1.53 (1.48)	1.47-1.56 (1.51)	2.19-2.44 (2.28)	2.78-3.19 (2.94)	9.9-12.3 (10.8)
<i>banningeri</i> ssp.	m	10	1.27-1.33 (1.29)	1.42-1.52 (1.47)	1.40-1.51 (1.46)	1.47-1.54 (1.50)	2.11-2.29 (2.24)	2.87-3.30 (3.09)	8.9-10.1 (9.8)
<i>katunensis</i>	f	7	1.26-1.31 (1.28)	1.40-1.53 (1.48)	1.40-1.49 (1.44)	1.44-1.51 (1.48)	2.28-2.39 (2.33)	2.74-3.06 (2.89)	10.0-10.8 (10.5)
<i>banningeri</i> ssp.	m	13	1.21-1.34 (1.27)	1.39-1.62 (1.47)	1.36-1.51 (1.44)	1.52-1.63 (1.57)	2.18-2.38 (2.29)	3.31-3.50 (3.42)	9.1-11.3 (10.3)
<i>korgonica</i>	f	9	1.22-1.32 (1.27)	1.39-1.62 (1.48)	1.39-1.49 (1.44)	1.51-1.64 (1.55)	2.21-2.50 (2.37)	3.06-3.20 (3.13)	10.2-12.3 (11.0)
ALL		286	1.18-1.37 (1.28)	1.30-1.62 (1.46)	1.35-1.61 (1.45)	1.44-1.64 (1.53)	2.04-2.52 (2.32)	2.74-4.13 (3.24)	8.2-12.3 (9.9)

lus) is complicated in shape and consists of two parts: basal and apical (Figs. 18, 19, 21). Sometimes these structures are indistinctly delimited. Apical part is with gonopodium. More or less developed protuberances and bulbs are set on dorsal, ventral and lateral sides. Basal part consists of dorso-basal (DB) and ventro-basal (VB) protuberances. Additional bulbs are always lacking in VB, but present in DB, near the endophallus base (DB1) and apical part (DB2). Apical part consists of the only apical protuberance (PA) which could be arranged with additional bulbs both from ventral (VA1) and dorsal (DA1, DA2) sides. Sometimes an additional bulb differing by thin transparent membrane can be disposed near gonopodium. The presence or absence of this bulb does not have taxonomic value and, probably, in vital specimens it is not extruded during copulation. Lateral bulbs (LB1, LB2, LA1) are often seen on the left side of extruded endophallus. A few bulbs are also disposed on the right side, but we used only LB3 in the taxonomic survey. We used following measurements for characteristic of related sizes of protuberances: L – basal part length; L1 – ventro-basal protuberance length; L2 – width of apical part; L3 – dorso-basal protuberance length; L4 – length of apical protuberance; W1, W2 – width of basal

part (Fig. 20, Table 2). We used 4 angles for the characteristic of relative position of basal and apical parts and a median lobe: A1, A2, A3, A4 (Figs. 20, 21).

KEY TO SPECIES AND SUBSPECIES

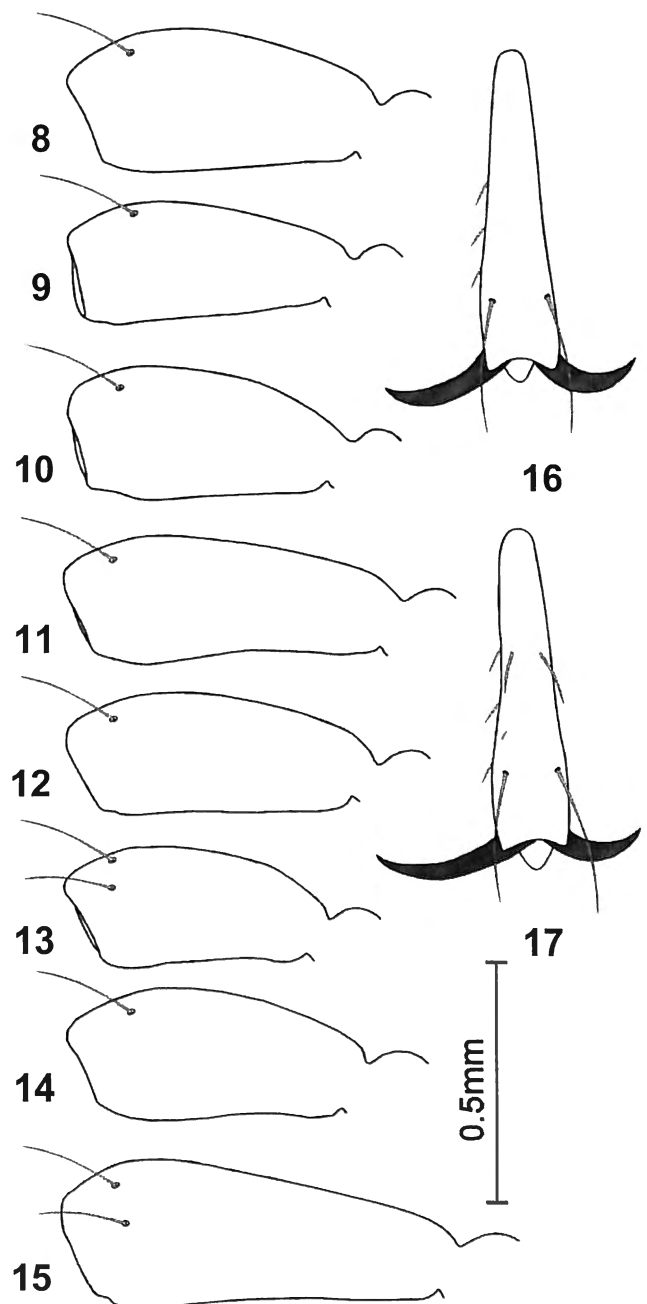
1. Abdominal sternites 3-5 with a row of 4-9 setae in the middle (Fig. 6). Western Sayan, Kuznetskij Alatau, northern and central Altai 2
- Abdominal sternites 3-5 with 2-3 irregular rows of 11-25 setae (Fig. 7). Western and central Altai 6
2. Aedeagus deeply impressed on a right side, its lamella short and rounded (Figs. 22-24, 36-39). 9-11 mm. Kuznetskij Alatau, north-eastern Altai - *N. mellyi* GEBL. 3
- Aedeagus not impressed, lamella longer (Figs. 25-30, 40-56). 8-10 mm. Western Sayan, northern and central Altai - *N. sajana* sp. n. 4
3. Aedeagus wider (Figs. 22, 23). Apical tarsomere in hind and intermediate legs with the only pair of subapical setae on dorsal side (Fig. 16). DA1 relatively large, DA2 very small or lacking (Figs. 75-78). Kuznetskij Alatau, Gornaya Shoria
. *N. mellyi* ssp. *mellyi* GEBL.

Table 2. Morphometrical characters of endophallus of *Nebria mellyi* group.

species, subspecies	N	(L1/L) · 100	(L2/L) · 100	(L3/L) · 100	(L4/L) · 100	(W2/L) · 100	(W1/W2) · 100	L (mm)
<i>mellyi</i> ssp. <i>mellyi</i>	10	23-33 (27)	19-30 (26)	42-56 (48)	64-91 (74)	41-53 (47)	100-120 (109)	1.50-1.80 (1.61)
<i>mellyi</i> ssp. <i>teletskiana</i>	9	24-34 (29)	23-33 (27)	40-50 (44)	61-86 (73)	38-44 (41)	100-136 (125)	1.50-2.00 (1.78)
<i>sajana</i> ssp. <i>sajana</i>	7	21-33 (28)	29-39 (34)	33-44 (39)	52-77 (67)	38-44 (42)	133-150 (144)	0.88-1.20 (1.01)
<i>sajana</i> ssp. <i>lomakini</i>	4	16-18 (17)	29-32 (30)	50-55 (53)	48-50 (50)	43-50 (46)	120-139 (131)	1.40-1.55 (1.49)
<i>sajana</i> ssp. <i>sarlyk</i>	1	14	36	50	64	46	123	1.40
<i>sajana</i> ssp. <i>dubatolovi</i>	6	33-38 (35)	21-27 (24)	38-46 (41)	55-63 (58)	36-44 (40)	100-117 (111)	1.45-1.65 (1.57)
<i>sajana</i> ssp. <i>sitnikovi</i>	3	26-27 (26)	28-31 (29)	43-46 (45)	70-74 (73)	37-44 (41)	135-147 (142)	1.05-1.35 (1.18)
<i>banningeri</i> ssp. <i>banningeri</i>	10	15-23 (20)	23-43 (33)	37-58 (48)	46-67 (55)	42-61 (53)	89-109 (98)	1.00-1.45 (1.18)
<i>banningeri</i> ssp. <i>katunensis</i>	4	5-11 (8)	51-61 (54)	28-43 (38)	86-100 (93)	47-67 (57)	108-135 (122)	0.90-1.23 (1.03)
<i>banningeri</i> ssp. <i>korgonica</i>	5	18-22 (20)	27-32 (29)	46-55 (51)	50-56 (52)	43-50 (46)	96-115 (102)	1.30-1.40 (1.35)
<i>arinae</i> ssp. <i>arinae</i>	9	27-40 (32)	38-48 (43)	15-29 (24)	62-83 (74)	48-71 (60)	79-126 (99)	1.00-1.30 (1.11)
<i>arinae</i> ssp. <i>zinchenkoi</i>	4	33-44 (41)	50-57 (55)	0-10 (5)	94-106 (100)	52-63 (57)	120-130 (126)	0.80-1.05 (0.93)
<i>roddei</i>	4	13-22 (18)	39-50 (44)	38-39 (38)	56-81 (67)	44-56 (50)	144-175 (161)	0.80-0.90 (0.83)

- Aedeagus narrower, especially in the basal part (Fig. 24). Apical tarsomere in hind and intermediate legs additionally with 2 small setae on dorsal side (Fig. 17). DA1 relatively smaller, DA2 always developed (Figs. 79-81). North-eastern Altai
 *N. mellyi teletskiana* ssp. n.
- 4. Aedeagus strongly narrowed in the basal part (Figs. 29, 30). Subspecies from north-western Altai 5
- Aedeagus not or weakly narrowed in basal part (Figs. 25-28). 8
- 5. Aedeagus smaller (about 1.9 mm in length) (Fig. 29). Lamella almost straight in ventral side (Fig. 54). Bastchelakskij Mt. Range
 *N. sajana sitnikovi* ssp. n.
- Aedeagus larger (about 2.2 mm in length) (Fig. 30). Lamella strongly curved ventrally before the tip (Figs. 55, 56). Seminskij Mt. Range
 *N. sajana sarlyk* ssp. n.
- 6. Lamella relatively short and wide, strongly curved from ventral side (Fig. 40-43), aedeagus wider and larger (Fig. 25). DA2 strongly produced, so the A2 strongly acute (less than 30). VB not protrudent and not hiding the penis tip (Figs. 95-97)
 *N. sajana dubatolovi* ssp. n.
- Lamella longer, aedeagus smaller (Figs. 26-28, 44-53). DA2 weakly produced, A2 is about 30-60. VB protrudent, hiding the penis tip (Figs. 82-88, 90-92) 7
- 7. Lamella is almost straight from ventral side (Figs. 44-48). LB2 smaller, A2 acute, A4 not more than 30° (Figs. 82-88, 98-104). Western Sayan, eastern Altai
 *N. sajana* ssp. *sajana*
- Lamella arcually curved in ventral side (Figs. 49-53). LB2 larger, A2 straight, A4 is about 45° (Figs. 90-92, 107-109). North-eastern Altai
 *N. sajana lomakini* ssp. n.
- 8. Antennae long, reaching the posterior half of elytra in both sexes, LAN/WB = 3.74-4.13 (males), 3.50-3.97 (females); upper surface dark-lurid to black-brown without metallic reflection; scape with a subapical seta (Figs. 11, 12). Endophallus indistinctly separate on basal and apical parts. L3 smaller than L1; A2 more than 120° (Figs. 113-119). 9.0-10.7 mm. Western Altai. - *N. arinae* sp. n. 9
- Antennae shorter, reaching anterior half of elytra, LAN/WB=2.76-3.37 (males), 2.74-3.24 (females). Upper surface black (sometimes with metallic reflection) or dark-lurid, if it is dark-lurid, so the scape possessing 2 subapical setae (Fig. 13). L3 larger than L1. 10
- 9. DA2 absent, L3/L=0.15-0.29 (Fig. 113-116). Scape somewhat longer (Fig. 11) . . *N. arinae* ssp. *arinae*
- DA2 distinctly developed, L3/L = 0.00-0.10 (Fig. 117-119). Scape somewhat shorter (Fig. 12). Western branches of Ivanovskij Mt. Range.
 *N. arinae zinchenkoi* ssp. n.
- 10. Elytral setiferous punctures small, striae punctured; pronotum above the hind angles very slightly sinuate

(Fig. 3); scape with two subapical setae (Fig. 13). Coloration of upper surface dark-lurid to black-brown without metallic reflection. LB1 lacking, LB2 disposed near endophallus base, LA1 small,



Figs. 8-17 — *Nebria* spp.

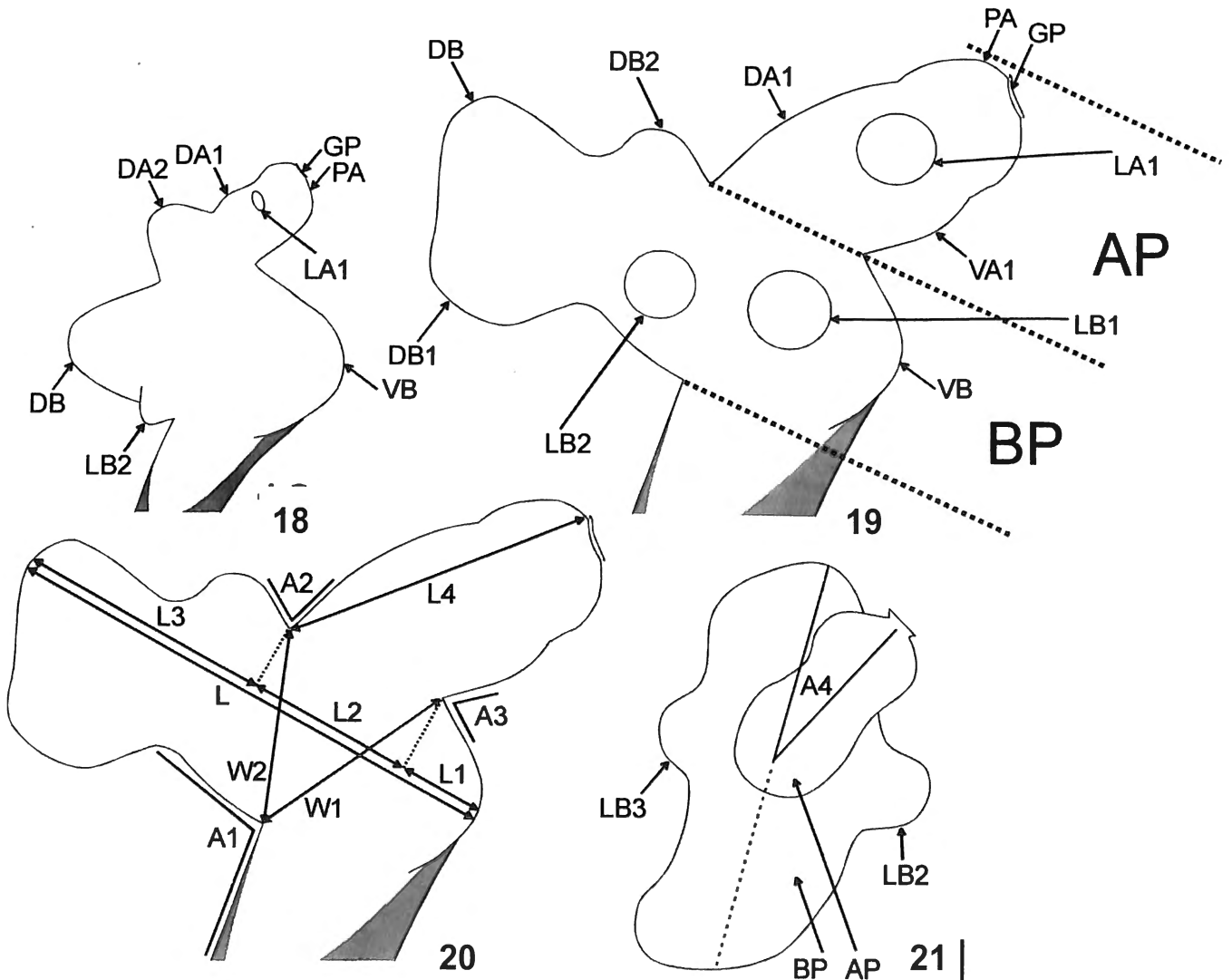
8-15 — Left scape, dorsal aspect: *N. mellyi mellyi* GEBLER, Chernyi Voron Mt. (8); *N. sajana sajana* ssp. n., Uyuk River (9); *N. sajana dubatolovi* ssp. n., Kastakhta River (10); *N. arinae arinae* ssp. n., Rossypnoj Belok Mt. (11); *N. arinae zinchenkoi* ssp. n. (12); *N. roddi* sp. n. (13); *N. banningeri banningeri* nom. nov., Kholzun Mt. Range (14); *N. banningeri korgonica* ssp. n. (15). 16, 17 — Apical tarsomere of right intermediate leg, dorsal aspect: *N. mellyi mellyi* GEBLER, Chernyi Voron Mt. (16); *N. mellyi teletskiana* ssp. n., Choochek Mt. Range (17).

- oval (Figs. 120-122). Katun' Mt. Range *N. roddei* sp. n.
- Elytral discal setiferous punctures broadly foveate, usually deep and separating the interval, striae less punctured. Pronotum above the hind angles strongly sinuate (Fig. 4). Scape with one apical seta (excepting ssp. *korgonica*). Upper surface black, sometimes with metallic reflection. LB1 developed, LB2 lacking, if present, found distant from the endophallus base, LA1 larger, round (Figs. 123-134). - *N. baenningeri* nom. nov. 11
 - 11. Scape longer, with the anterior part being almost straight in the middle and at the base; possess two subapical setae (Fig. 15). DB3 narrow, protrudent, A1 very obtuse (Figs. 129-131). Western Altai: Korgon and Tigirek Mt. Ranges *N. baenningeri korgonica* ssp. n.
 - Scape shorter, with the anterior part being evenly

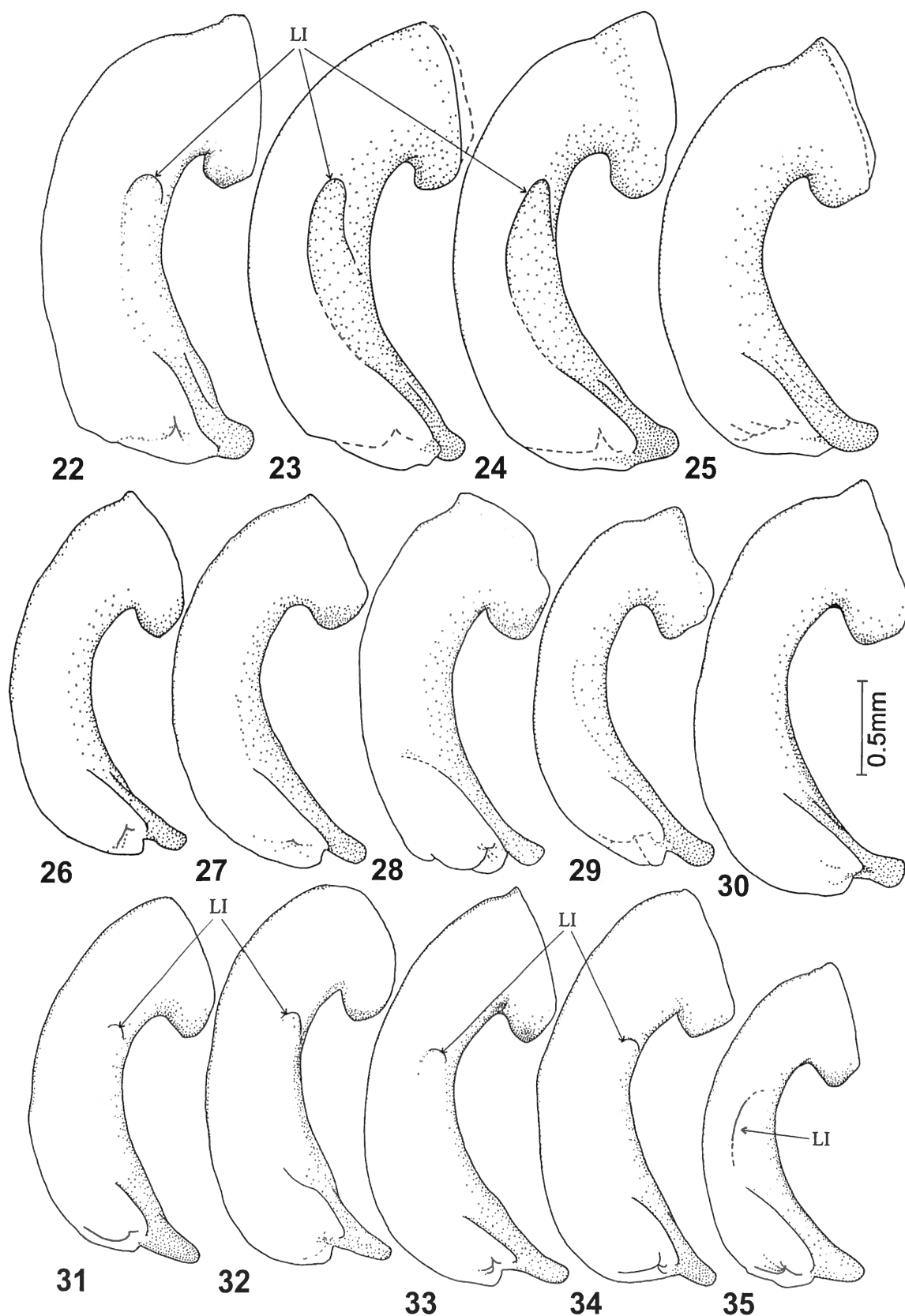
- convex (Fig. 14); normally possess the only subapical seta. DB3 wide, less protrudent, A1 less obtuse (Figs. 123-128, 132-134) 12
- 12. $L4/L = 0.86-1.0$, L1 smaller than L2. VA1 larger and distinctly separate (Figs. 132-134). Upper surface black without metallic reflection. Central Altai: Katun' Mt. Range . *N. baenningeri katunensis* ssp. n.
- $L4/L = 0.46-0.67$, L1 bigger than L2. VA1 weakly separate (Figs. 123-128). Upper surface usually with metallic reflection. Western Altai *N. baenningeri* ssp. *baenningeri* nom. nov.

***Nebria mellyi* GEBLER**

Nebria mellyi GEBLER, 1847, Bull. Soc. Nat. Mosc., 20, 2: 312 (loc. class. - "Flusses Ters im Kusnezkschen Gebirge").



Figs. 18-21 — *Nebria mellyi* group, scheme of endophallus structure and morphometrical characteres.
 AP – apical part of endophallus; BP – basal part of endophallus; DA1, DA2 – dorso-apical additional bulbs; DB – dorso-basal protuberance; DB1, DB2 – dorso-basal additional bulbs; GP – gonopodium; LA1 – latero-apical additional bulb; LB1, LB2, LB3 – latero-basal additional bulbs; VA1 – ventro-apical additional bulb; VB – ventro-basal protuberance.
 A1, A2, A3, A4, L, L1, L2, L3, W1, W2 – morphometrical characteres of endophallus.



Figs. 22-35 — *Nebria* spp., median lobe of aedeagus, right lateral aspect.

22, 23 — *N. mellyi mellyi* GEBLER: lectotype (22), Pustag Mt. (23); 24 — *N. mellyi teletskiana* ssp. n., Chochek Mt. Range; 25 — *N. sajana dubatolovi* ssp. n., Kastakhta River; 26, 27 — *N. sajana sajana* ssp. n.: Uyuk River (26), Kulumys Mt. Range (27); 28 — *N. sajana lomakini* ssp. n., Ayukel Mt.; 29 — *N. sajana sitnikovi* ssp. n., holotype; 30 — *N. sajana sarlyk* ssp. n., holotype; 31 — *N. banningeri banningeri* nom. nov., Vysheivanovskij Belok Mt.; 32 — *N. banningeri katunensis* ssp. n., Rakhmanovskiye Kluchi; 33 — *N. banningeri korgonica* ssp. n.; 34 — *N. arinae arinae* ssp. n., Rossypnoj Belok Mt.; 35 — *N. roddei* sp. n.

LI — Longitudinal impression.

Nebria mellyi BÄNNINGER, 1921, Ent. Mitteil., 10, 5: 153.
Nebria mellyi BÄNNINGER, 1925, Ent. Mitteil., 14, 3-4: 264.

Nebria mellyi CSIKI, 1927: 369.

Nebria mellyi SHILENKOV, 1975: 837.

Nebria mellyi KRYZHANOVSKIJ & al., 1995: 31.

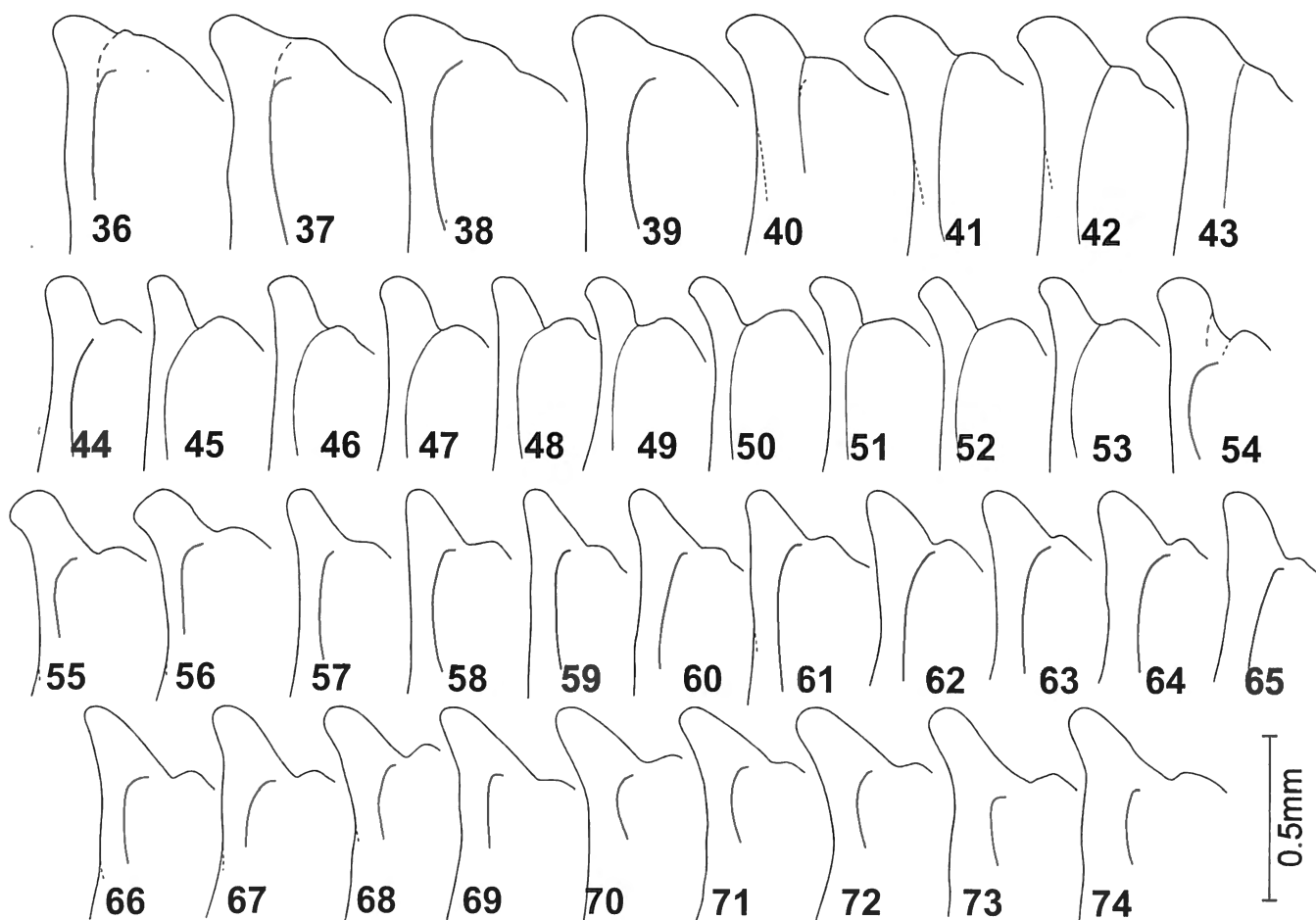
Redescription. Body (Fig. 1) black, upper surface without metallic reflection. Vertex with two small distinctly separated red spots. Legs dark, with tarsi lighter, sometimes legs completely red. Antennae long and slender, reaching the middle of elytra in both sexes; scape elongate and slightly widened anteriorly, with a subapical seta (Fig. 8). Pronotum cordate with hind angles slightly acute, being markedly sinuate posteriorly. Peripheral parts of pronotum finely punctate.

Margination of elytral base straight or slightly sinuate

jointed with lateral margin arcually or at very obtuse angle. Elytral discal setiferous pores broadly foveate, interval 3 with 4 to 6 pores; interval 5 poreless, rarely with 1 or 2 pores; interval 7 poreless or with 1 or 2 pores. Striae deep, distinctly punctate. Abdominal sternites 3 to 5 with two to four pairs of posterior paramedial setae (Fig. 6). Base of hind coxa with 2, rarely 3 or 4, setae.

Aedeagus relatively large, with deep longitudinal impression on basal half of right side (Figs. 22-24). Apex very short, evenly rounded, distinctly curved ventrally (in lateral aspect) (Figs. 36-39).

Endophallus large, with markedly limited basal and apical parts (Figs. 75-81). Additional bulbs DB1 and LB2 present in basal part; in apical part large bulb DA1 and small one DA2 are present, DA2 sometimes lacking. DB1 and DA2 markedly translocate on right side. Angle A2 acute.



Figs. 36-74 — *Nebria* spp., apical part of aedeagus, right lateral aspect.

36, 37 — *N. mellyi mellyi* GEBLER: Pustag Mt. (36), Teren'-Kazyr Mt. Range (37); 38, 39 — *N. mellyi teletskiana* sp. n.: Choochek Mt. Range (38), Konyi River (39); 40-43 — *N. sajana dubatolovi* ssp. n.: Kastakhta River (40-42), Katun' Mt. Range (43); 44-48 — *N. sajana sajana* ssp. n.: Kulumys Mt. Range (44), Uyük River (45), Kurkure Mt. Range (46-48); 49-53 — *N. sajana lomakini* ssp. n.: Ayukel Mt. (49-52), Chelyush River (53); 54 — *N. sajana sitnikovi* ssp. n., holotype; 55, 56 — *N. sajana sarlyk* ssp. n.: holotype (55), paratype (56); 57-60 — *N. arinae arinae* ssp. n.: Rossypnoj Belok Mt. (57, 58), Gromotukha River (59), Vysheivanovskij Belok Mt. (60); 61 — *N. arinae zinchenkoi* ssp. n.; 62-65 — *N. roddi* sp. n.; 66-68 — *N. banningeri katunensis* ssp. n., Rakhmanovskiye Klyuchi; 69-72 — *N. banningeri banningeri* nom. nov.: Vysheivanovskij Belok Mt. (69), Kholzun Mt. Range (70); Tesninskij Belok Mt. (71-72); 73, 74 — *N. banningeri korgonica* ssp. n.

Habitats. The species occurs in the alpine zone at 1300-2700 m a.s.l., usually near snow patches. Immature beetles were found in Kuznetskij Alatau in the second half of May.

Distribution. Restricted from Kuznetskij Alatau to north-eastern Altai (Fig. 135-A, B).

The species is geographically variable and includes two subspecies.

Nebria mellyi ssp. *mellyi* GEBLER

Lectotype, male, collection of F. Gebler (ZISP), designated here, is supported by few labels: 1) quadrate of gold paper; 2) "Sibir." – label on rose paper; 3) "Mellyi Gebler Siber. occ." – manuscript label on white paper. Paralectotype (ZISP), provided with following labels: 1) quadrate of gold paper; 2) "Sibir."; paralectotype (ZISP), with label: "Mellyi Gebler Siber. occ." – manuscript label on white paper.

Other material includes 362 specimens from localities given below.

Russia. Kemerovo Area: Kuznetskij Alatau Mt. Range, Chemodan Mt., N. Demidenko leg., 20.07.1988 (1 female), idem, 13.07.1990 (1 female), 20.06.1991 (1 male), 23.06.1991 (1 male), 24.06.1993 (1 female); Bol'shaya Tserkovnaya Mt., N. Demidenko leg., 15.07.1994 (1 male); Terehtinskij Mt. Range, Chernyi Voron Mt., 1200 m a.s.l., in stones, D. Efimov leg. (1 male, 4 females); Tigirtish Mt. Range, near Igli Mt., snow edge, above Yubileinoe Plateau, 23.07.1995, Yu. Mikhailov leg. (1 male, 4 females); Gornaya Shoria, Pustag Mt., 10 km N of Sheregesh village, 1300-1500 m a.s.l., alpine meadow, 13-26.06.1999, D. Lomakin leg. (165 specimens). – Khakasia: Teren'-Kazyr Mt. Range, 15-25 km NNE of Balyksu, 1500-1900 m a.s.l., alpine meadow, 20-21.05.1997, R. Dudko & A. Vorontsov leg. (138 specimens); Abakan Mt. Range, 60 km WNW of Tashtyp village, Bol'shaya Kol'tajga Mt., 1400-1800 m a.s.l., 16-25.06.2000, D. Lomakin leg. (43 specimens).

Diagnosis. This subspecies differs from *N. mellyi teletskiana* ssp. n. in having the only pair of subapical setae on the dorsal side of the apical tarsomeres of intermediate and posterior legs (Fig. 16), relatively wide aedeagus (Figs. 22, 23), and by strongly reduced DA2 and developed DA1 (Figs. 75-78).

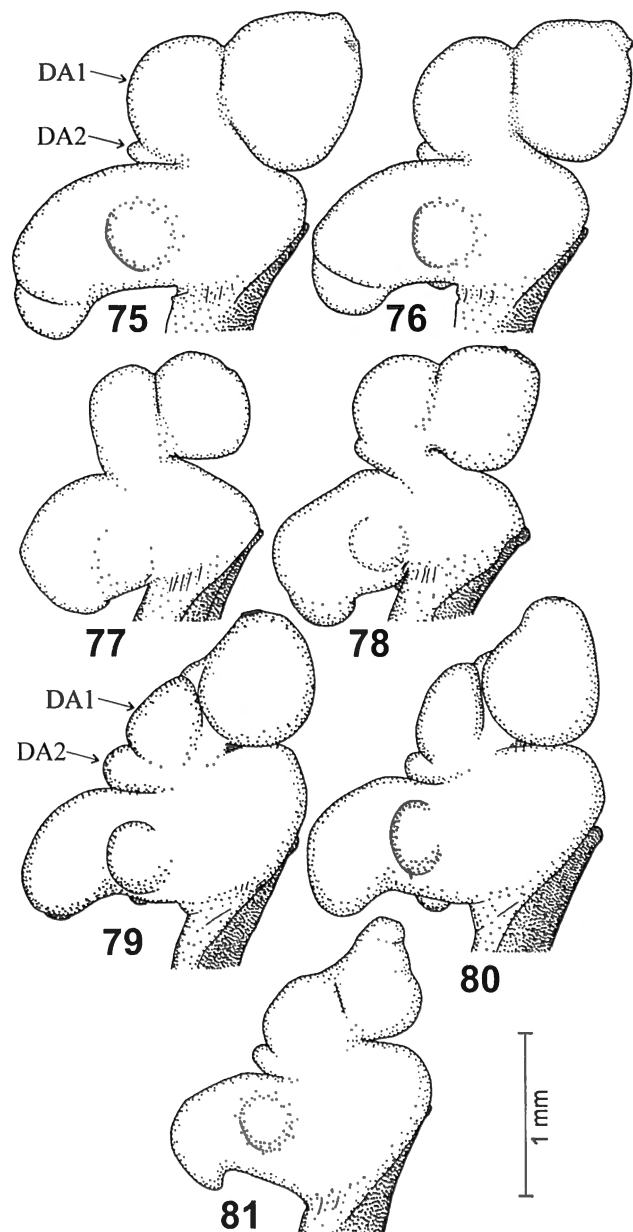
Distribution. Ranged in mountains of Kuznetskij Alatau and Gornaya Shoria and substituted by ssp. *teletskiana* to the south of 52° 40' N (Fig. 135-A).

Nebria mellyi teletskiana ssp. n.

Holotype: male (SZMN), SW Khakasia, branch of Abakan Mt. Range, Choochek Mt. Range, 20 km SSE of

Mrassu village, alpine zone, 1600-1800 m a.s.l., 7-19.07.1999, D. Lomakin leg.

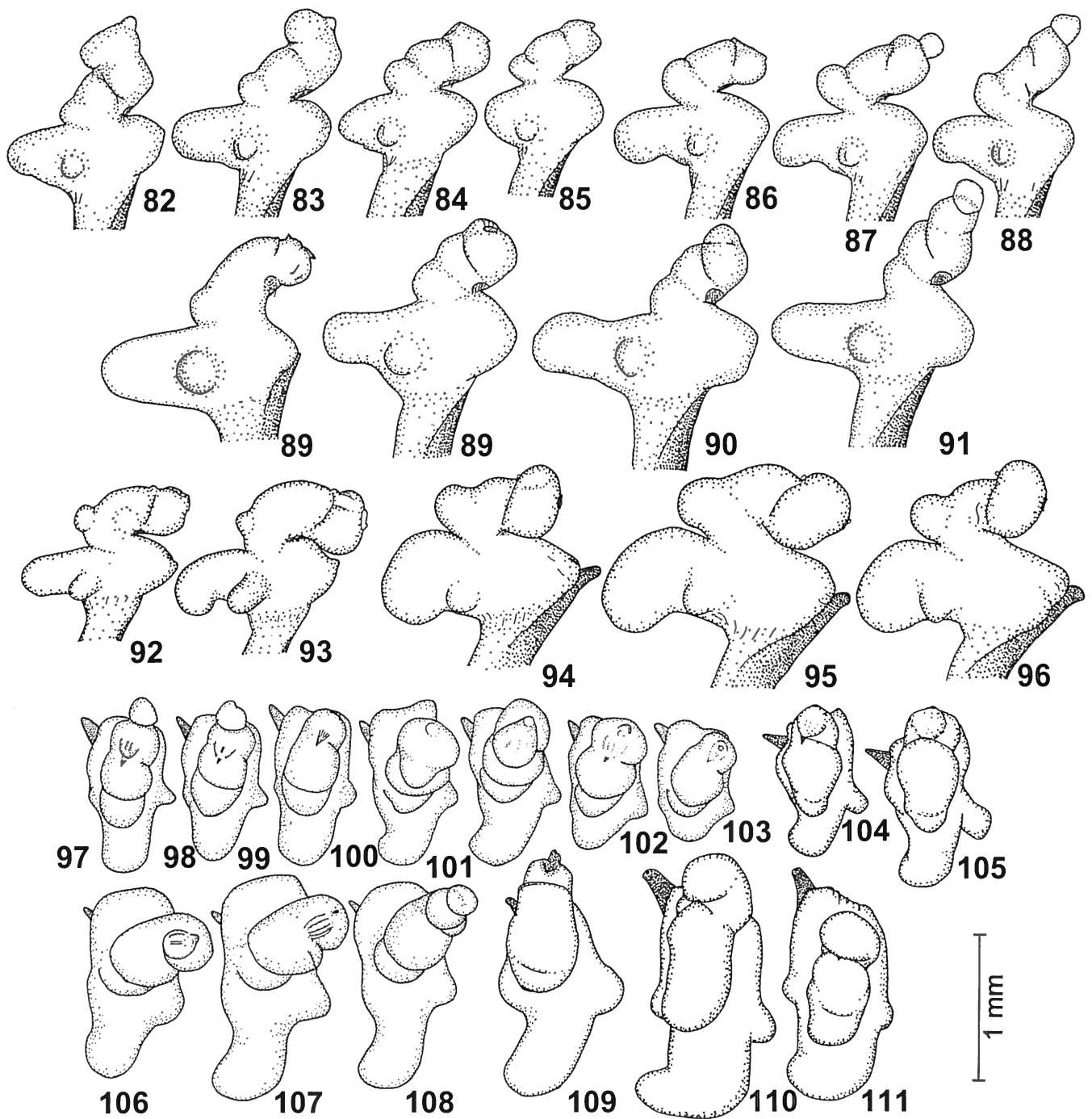
Paratypes: 97 specimens (SZMN, ZISP, KBIN, MPU, ISU) collected together with holotype; 34 specimens (SZMN), Western Sayan, 50 km SSW of Tashtyp village, central part of Khansyn Mt. Range, 1800-2100 m a.s.l., 11-24.07.2000, D.E. Lomakin leg.; 1 male (SZMN), NE Altai, near Teletskoye Lake, 25 km E of Yailyu village, the upper stream of right tributary of Kokshi River, 1900 m a.s.l., 26.07.1994, D. Lomakin leg.; 3 females



Figs. 75-81 — *Nebria mellyi* GEBLER, endophallus, left lateral aspect.

75-78 — *N. m. mellyi* GEBLER: Teren'-Kazyrskij Mt. Range (75, 76), Tigirtish Mt. Range (77), Pustag Mt. (78); 79-81 — *N. m. teletskiana* ssp. n.: Choochek Mr. Range (79, 80), Altyntu Mt. (81).

DA1, DA2 – dorso-apical additional bulbs.



Figs. 82-112 — *Nebria sajana* sp. n., endophallus.

82-97 — left lateral aspect. 82-88 — *N. s. sajana* ssp. n.: Sambyl Pass (82), Uyk River (83, 84), Kulumys Mt. Range (85), Kurkure Mt. Range (86, 88), Elbektularkyr Mt. Range (87); 89 — *N. s. sarlyk* ssp. n., holotype; 90-92 — *N. s. lomakini* ssp. n.: Auykel Mt. (90, 91), holotype (91), Chelyush River (92); 93, 94 — *N. s. sitnikovi* ssp. n.: holotype (93), paratype (94); 95-97 — *N. s. dubatolovi* ssp. n., Kastakhta River.

98-112 — dorsal aspect. 98-104 — *N. s. sajana* ssp. n.: Elbektularkyr Mt. Range (98, 99), Kurkure Mt. Range (100), Sambyl Pass (101), Uyk River (102, 103), Kulumys Mt. Range (104); 105-106 — *N. s. sitnikovi* ssp. n.: holotype (105), paratype (106); 107-109 — *N. s. lomakini* ssp. n.: Auykel Mt. (107, 108), holotype (108), Chelyush River (109); 110 — *N. s. sarlyk* ssp. n., holotype; 111-112 — *N. s. dubatolovi* ssp. n., Kastakhta River.

(SZMN, ISU), the same locality, the upper stream of Konyi River, 1800 m a.s.l., 25.07.1994, R. Dudko leg.; 2 females (SZMN), idem, 1850 m a.s.l., D. Lomakin leg.;

16 specimens (ZISP, SZMN), Altai, SW of Teletskoye Lake, Altyntu Mt., 11-13.07.1912, Sushkin & Redikortsev leg.; 1 female (MPU), Altai, Sumulta Mt. Range,

Shtativ Pass, 2800 m a.s.l., 20.06.1986, A. Matalin leg.; 14 specimens (MPU, SZMN), central Altai, SW slope of Iolgo Mt. Range, Akkaya Pass, 2100 m a.s.l., 6.07.1999, A. Matalin leg.; 24 specimens (ZISP, CF), idem, source of Akkaya River, 2050 m a.s.l., snow edge, 6.07.1999, D. Fedorenko leg.; 14 specimens (MPU, SZMN), idem, the upper stream of Akkaya River, stones on right bank of Akkaya Lake, snow edge, 2000 m a.s.l., 7.07.1999, A. Matalin leg.; 54 specimens (MPU, CF), idem, the upper stream of Lozha River, snow edge, 1900 m a.s.l., 10.07.1999, A. Matalin & D. Fedorenko leg.; 4 specimens (MPU, CF), central Altai, Kuminskii Mt. Range, Saigonosh Pass, snow edge, 1900 m a.s.l., 14.07.1999, A. Matalin & D. Fedorenko leg.; 17 specimens (MPU, SZMN), idem, NE slope of Tomanel Mt., snow edge, 2200 m a.s.l., 15.07.1999, A. Matalin leg.; 9 specimens (ZISP, CF), idem, 2150 m a.s.l., D. Fedorenko leg.; 2 males, 4 females (ZISP), "Altai", "13.VII".

Diagnosis. Looks very similar to the nominative subspecies, but has two additional small setae together with a pair of subapical ones on the upper side of the apical tarsomeres of intermediate and posterior legs (Fig. 17). Aedeagus slightly narrower, especially in basal part (Fig. 24). DA1 is relatively small, DA2 – large. (Figs. 79-81).

Distribution. Distributed in north-eastern Altai: mountains of north-eastern and south-western parts of Teletskoye Lake, east of Katun' River, west of Abakan and Chulyshman Rivers (Fig. 135-B).

Nebria sajana sp. n.

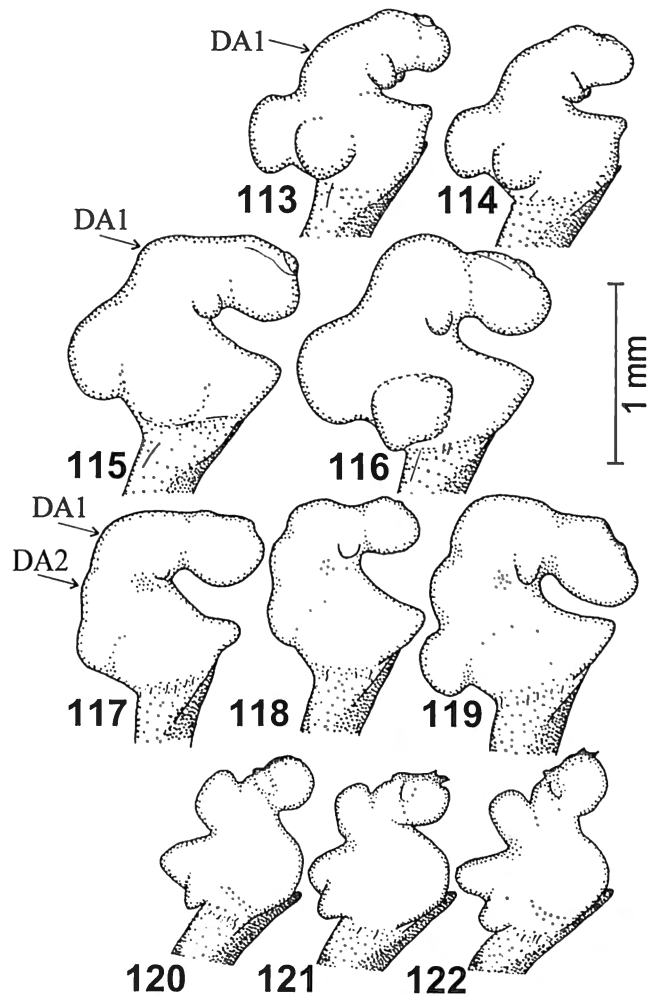
This new species includes five subspecies.

Description. Body black, upperside without metallic reflection. Vertex with two small and distinctly separated red spots, which sometimes can be larger and closer. Legs dark, with lighter tibiae and tarsi, sometimes legs completely red. Antennae long and slender, reaching the middle of elytra in males and only basal third of elytra in females; scape elongate and slightly widened anteriorly, with a subapical seta (Figs. 9, 10).

Pronotum cordate with hind angles slightly acute, markedly sinuate posteriorly. Peripheral parts of pronotum finely punctate and sometimes slightly rugose.

Margination of elytral base straight or slightly sinuate and jointed with lateral margin arcuately or at very obtuse angle. Elytral discal setiferous pores broadly foveate, the third interval with 3 to 6 pores; fifth and seventh intervals poreless or rarely with 1 pore. Striae deep, distinctly punctate. Abdominal sternites 3 to 5 with four to nine of posterior paramedial setae. Base of hind coxa with 2 or 3 setae.

Aedeagus without longitudinal impression on basal half of right side (Figs. 25-30). Apex (in lateral aspect) almost parallel-sided, slightly or distinctly curved ventrally (Figs. 40-56).

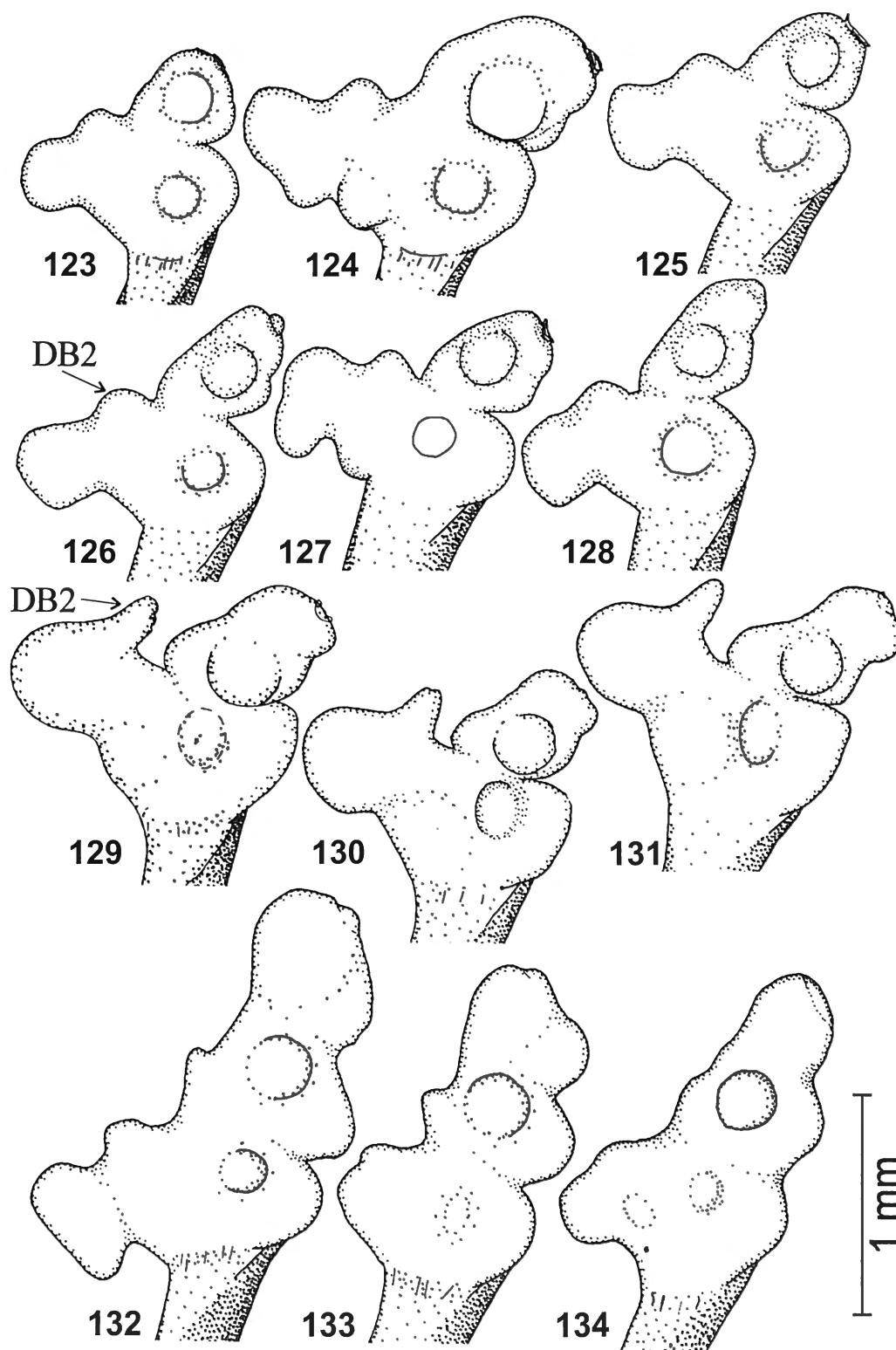


Figs. 113-122 — *Nebria* spp., endophallus, left lateral aspect. 113-116 – *N. arinae arinae* ssp. n.: Kholzun Mt. Range (113, 114), Rossypnoj Belok Mt. (115), Vysheivanovskij Belok Mt. (116); 117-119 – *N. arinae zinchenkoi* ssp. n.; 120-122 – *N. roddei* sp. n.

Basal and apical parts of endophallus markedly limited. Additional bulbs LB2 present in basal part, DA1 and DA2 present in apical part. VA with sclerotise area which usually bears small spines. Angle A2 acute or right (Figs. 82-112).

Diagnosis. *N. sajana* sp. n. is very close to *N. mellyi*, but differs by the absence of a longitudinal impression of the right side in aedeagus, and more elongate and unevenly rounded lamella. DA2 larger, not turned to the right side. This species differs from other Palaearctic species of the *N. mellyi* – group by the presence of only 4 to 9 posterior paramedial setae in 3-5 abdominal sternites.

Habitats. The species occurs in the alpine zone, about 1500-2900 m a.s.l., usually near snow patches. Immature beetles of *N. sajana* ssp. *sitnikovi* have been found at the end of July and the beginning of August.



Figs. 123-134 — *Nebria banningeri* nom. nov., endophallus, left lateral aspect.

123-128 — *N. b. banningeri* nom. nov.: Kholzun Mt. Range (123), Tesninskij Belok Mt. (124), Vysheivanovskij Belok Mt. (125, 128), Rossypnoj Belok Mt. (126, 127); 129-131 — *N. b. korgonica* ssp. n.; 132-134 — *N. b. katunensis* ssp. n., Rakhmanovskiye Klyuchi.
DB2- dorso-basal additional bulb.

Distribution. Distributed in northern, central and eastern Altai and Western Sayan (Fig. 135-C-G).

***Nebria sajana sajana* ssp. n.**

Holotype: male (ZISP), Western Sayan, basin of Abakan River, source of Uyuk River, 2000 m a.s.l., 7.07.1993, Belousov & Molchanov leg.

Paratypes: 16 males, 18 females (ZISP, SZMN, ISU, CB), collected together with holotype; 11 males, 12 females (ZISP, SZMN, ISU, CB), the same locality, Sambyl Pass, 1900-2000 m a.s.l., 1-2.07.1993, Belousov & Molchanov leg.; 2 females (CB), the same locality, Kantegir Mt. Range, Suyusnikey Mt., 5.07.1993, Belousov & Molchanov leg.; 1 male, 6 females (ZISP), idem, watershed of Kantegir & Uyuk rivers, h=2400 m a.s.l., 5-6.VII.1993., Belousov & Molchanov; 5 males, 6 females (ISU, SZMN), Western Sayan, Kulumys Mt. Range, 1800 m a.s.l., Mt. Pass, 11-18.07.1985, V. Shilenkov leg.; 1 female (MPU), Krasnoyarsk Terr., Western Sayan, Aradanskij Mt. Range, Bujba Pass, near Oiskoye Lake, 1500-2300 m. a.s.l., 16-18.07.1995, A. Brynev leg.; 2 males (MPU, ISU), idem, 9-11.07.1995; 19 specimens (MPU, SZMN), idem, the upper stream of Aradanka River, 2300 m a.s.l., 52 35' N, 93 07' E, 3-8.07.1998, A. Brynev leg.; 25 specimens (MPU, SZMN), Krasnoyarsk Terr., Western Sayan, Baldyr-Taiga Mt. Range, left tributary of Us River, the upper stream of Chap River, 20-22.07.2000, A. Brynev leg.; 3 males, 1 female (SZMN, ZISP), Altai, Chulyshman Upland, Kurkure Mt. Range, Bank of the Lake, left source of the Katuyaryk River, 2600 m a.s.l., 23.06.1994, D.E. Lomakin leg.; 1 male, 6 females (SZMN, ISU), idem, the upper stream of Katuyaryk River, snow edge, 2800 m a.s.l., 23.06.1994, A. & R. Dudko leg.; 1 male, 3 females (SZMN, ISU), idem, 2500 m a.s.l., A. & R. Dudko leg.; 1 male, 1 female (SZMN, ISU), idem, the upper stream of Maloye Kurkure River, snow edge, 2400 m a.s.l., 28.06.1994, D.E. Lomakin leg.; 1 male, 5 females (KBIN, SZMN), idem, 2800 m a.s.l., A. & R. Dudko, 1 female (ISU), idem, E.I. Anisimov leg.; 1 female (SZMN), idem, the upper stream of the Bazhiuzhume River, snow edge, 2200-2300 m a.s.l., A. & R. Dudko leg.; 1 male (SZMN), idem, 2600 m a.s.l.; 1 male, 2 females (SZMN), idem, 6 km W of the top of Kurkurebazhi Mt., Bank of Lake, 2400 m a.s.l., 30.06.1994, A. & R. Dudko & D.E. Lomakin leg.; 4 males, 3 females (SZMN), north-eastern Altai, Elbektularkyr Mt. Range, the upper stream of Meiryksu River, snow edge, 2400 m a.s.l., 5.07.1994, A. & R. Dudko & D. Lomakin leg.; 1 male, 1 female (SZMN, ISU), idem, watershed of Meiryksu and Ekinchisu Rivers, snow edge, 2600 m a.s.l., 5.07.1994, D.E. Lomakin leg.

Diagnosis. Differs from the other subspecies (excepting *sitnikovi* ssp. n.) by its slightly curved ventrally lamella which is almost straight (Figs. 44-48). From ssp. *lomakini*, occurring on the neighbouring territory, it can be easily distinguished by following characters: LB2 smaller, A2 acute, A4 not more than 30° (Figs. 82-88, 98-104); from

ssp. *sitnikovi* differs by the wider base of aedeagus; from *N. mellyi* ssp. *teletskiana*, restricted in north-eastern Altai, differs by the absence of additional setae on the upperside of intermediate and posterior tarsomeres and by the shape of male genitalia.

Variability. Populations from the different mountain ranges are slightly distinctive; for example, specimens from Altai (Kurkure and Elbektularkyr Mt. ranges) have flattened elytral intervals, lighter legs and a wider lamella to the aedeagus. Some endophallic parameters (L, A3, A4) are also different, these characters are less distinctive than the same structures in subspecies. These features show that these populations cannot be presented as subspecies.

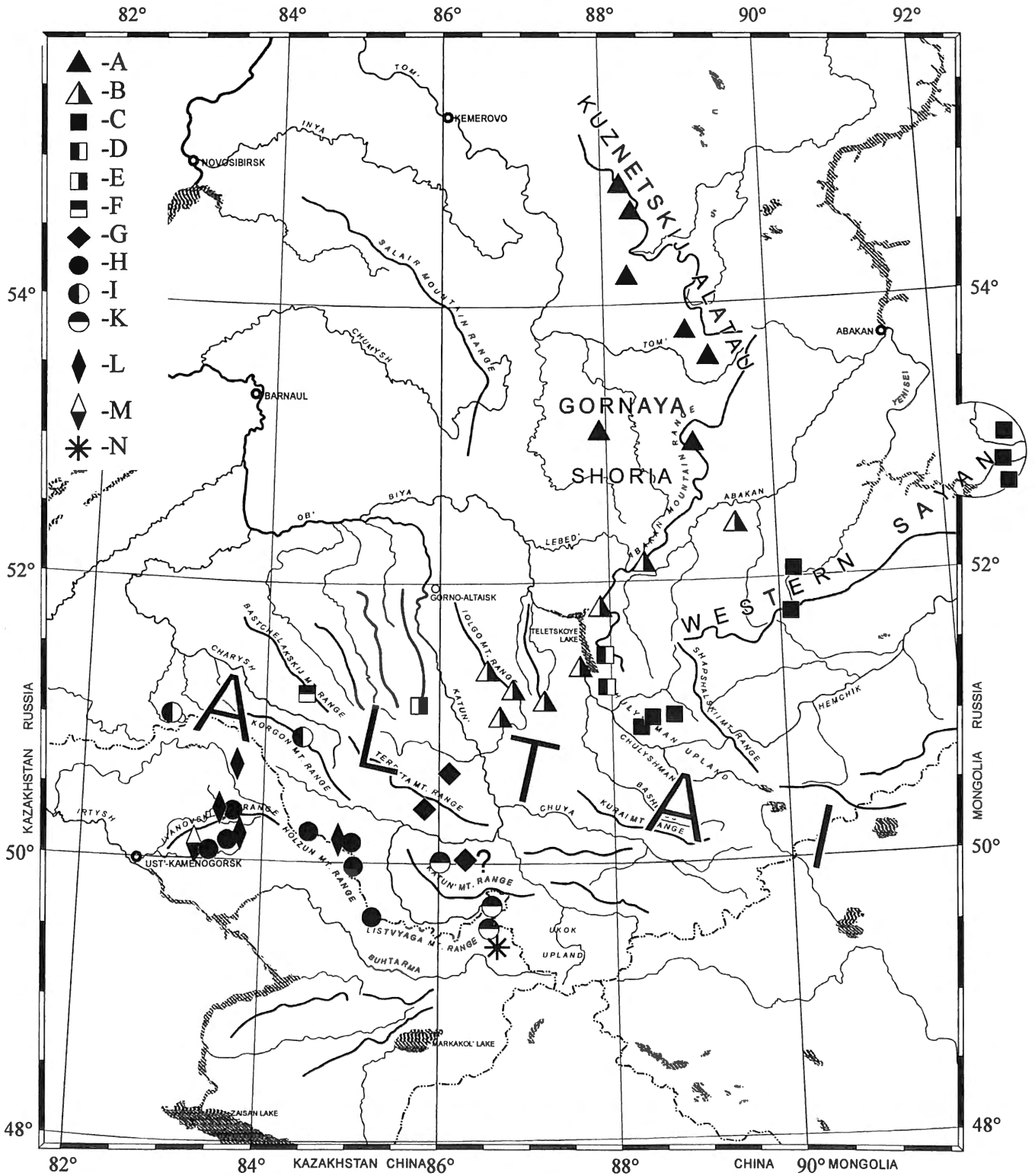
Distribution. Distributed in eastern Altai and Western Sayan (Fig. 135-C).

***Nebria sajana lomakini* ssp. n.**

Holotype: male (SZMN), Altai, N part of Chulyshman Upland, Ayukel Mt., snow edge, 2420 m a.s.l., 2.07.1993, D.E. Lomakin leg.;

Paratypes: 17 males, 10 females (SZMN, ZISP, KBIN, IGU, MPU, CB), collected together with holotype; 1 male, 1 female (SZMN), idem, SE slope of Ayukel Mt., bank of Lake, snow edge, 2080 m a.s.l., 14.07.1993, D.E. Lomakin leg.; 1 male, 1 female (SZMN), idem, N slope of Ayukel Mt., Bank of Bayas Lake, snow edge, 1960 m a.s.l., 28.06.1993, D.E. Lomakin leg.; 1 male (SZMN), idem, Tongzyak Mt., snow edge, 2200 m a.s.l., 29.06.1993, D.E. Lomakin leg.; 1 male, 3 females (SZMN), idem, E Slope of Ayukel Mt., Bank of Ayukel Lake, snow edge, 2040 m a.s.l., 14.07.1993, D.E. Lomakin leg.; 1 male, 5 females (SZMN), idem, N slope of Ayukel Mt., snow edge, 1970 m a.s.l., 16.07.1993, D.E. Lomakin leg.; 1 male, 5 females (SZMN), idem, Ayukel Mt., snow edge, 2420 m a.s.l., 16.07.1993, D.E. Lomakin leg.; 1 male, 3 females (SZMN), idem, N Slope of Ayukel Mt., snow edge, 2300 m a.s.l., 16.07.1993, D.E. Lomakin leg.; 2 males (SZMN), Altai, near Teletskoye Lake, near upper stream of Chelyush River, at upper limit of forest, 1850 m a.s.l., 4.06.1994, D.E. Lomakin leg.

Diagnosis. This subspecies differs from the nominative form by its strongly curved lamella, larger bulb LB2, less acute (more than 45) angle A4 and right angle A2 (Figs. 49-53, 90-92, 107-109). These characters are more strongly developed in comparison with populations of *N. sajana sajana* from Altai. *N. sajana lomakini* is similar to *N. sajana sarlyk* according to the shape of lamella and LB2, but differs by the less developed LB3 and less acute A4 (Figs. 107-109). *N. sajana lomakini* differs from *N. mellyi* ssp. *teletskiana*, restricted in NE Altai, by the absence of additional setae on the upperside of intermediate and posterior tarsomeres and by the shape of male genitalia.



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Fig. 135 — Distribution of *Nebria mellyi* group.

A — *N. mellyi mellyi* GEBLER, B — *N. mellyi teletskiana* ssp. n., C — *N. sajana sajana* ssp. n., D — *N. sajana lomakini* ssp. n., E — *N. sajana sarlyk* ssp. n., F — *N. sajana sitnikovi* ssp. n., G — *N. sajana dubatolovi* ssp. n., H — *N. banningeri banningeri* nom. nov., I — *N. banningeri korgonica* ssp. n., K — *N. banningeri katunensis* ssp. n., L — *N. arinae arinae* ssp. n., M — *N. arinae zinchenkoi* ssp. n., N — *N. roddi* sp. n.

Distribution. Distributed in north-eastern Altai: mountains near south-eastern part of Teletskoye Lake (Fig. 135-D).

Etymology. The subspecies is named after Mr D.E. Lomakin, our colleague from Tyumen.

***Nebria sajana sarlyk* ssp. n.**

Holotype: male (ZISP), Altai, Seminskij Mt. Range, Sarlyk Mt., 1900-2100 m a.s.l., 22.07.1983, V. Shilenkov leg.

Paratypes: 4 males, 11 females (ZISP, ISU, SZMN), collected together with holotype.

Diagnosis. It is characterised by the lamella which is strongly curved ventrally (Figs. 55, 56). By this character this subspecies is closely related to *N. sajana lomakini* and *N. sajana dubatolovi*. It differs from *N. sajana lomakini* by narrowed to the base aedeagus (Fig. 30), well developed LB3 and strongly acute A4 (Fig. 89, 110); from *N. sajana dubatolovi* it can be distinguished by more narrow lamella and large LB2 and LB3.

Distribution. The new subspecies is known from its type locality only: Seminskij Mt. Range, Sarlyk Mt. (Fig. 135-E).

***Nebria sajana dubatolovi* ssp. n.**

Holotype: male (SZMN), Altai, S slope of Terekta Mt. Range, the upper stream of Kastakhta River, 2000-2400 m a.s.l., mountain tundra, 18-20.06.1999, A. & R. Dudko leg.

71 specimens (SZMN, ZISP, KBIN, MPU, ISU), collected together with holotype; 1 female (SZMN), Altai, Terekta Mt. Range, 10 km SSW of Ongudai village, 2000 m a.s.l., 18.07.1997, V.V. Sinitsin leg.; 2 males (SZMN), "Altai, Katun' Mt. Range, 15 km SE of Katanda, 2300 m a.s.l., 10-13.07.1983, V.V. Dubatolov".

Diagnosis. From the other subspecies it strongly differs by the large and wide aedeagus (Fig. 25), and very wide and strongly ventrally curved lamella (Figs. 40-43). From the left aspect of the endophallus the tip of the aedeagus is distinctly noticeable (Figs. 95-97). This subspecies is similar to *N. sajana sarlyk*, and differs by wider lamella and relatively small LB2 and LB3.

Distribution. Distributed in central Altai: Terekta and ?Katun' Mt. Range (Fig. 135-G). Probably the specimens collected by Dr V. Dubatolov and provided with label: "Katun' Mt. Range" are wrongly labelled. Collections by R. Dudko from two localities of Katun' Mt. Range represents only two species of *N. mellyi* group: *N. roddei* sp. n. and *N. baenningeri katunensis* ssp. n. Another

species, *N. (Pseudonebriola) kaszabi* SHILENKOV, which has the same habitat distribution, has also been collected together with these beetles. The presence of the other petrophilous species on the same range is unlikely. During the expedition of 1983, Dr V.V. Dubatolov collected beetles on Katun' Mt. Range as well as on the Terekta Range. Thus, we believe that both specimens have been found on Terekta Mt. Range.

Etymology. The subspecies is named after Dr V.V. Dubatolov, our colleague from the Siberian Zoological Museum.

***Nebria sajana sitnikovi* ssp. n.**

Holotype: male (SZMN), north-western Altai, Bastchelakskij Mt. Range, 27 km SSW of Topol'noye, 1800-2200 m a.s.l., 28.07-6.08.1998, D.E. Lomakin leg.

Paratypes: 2males, 5 females (SZMN), collected together with holotype; 1 female (SZMN), Altai Terr., Charysh Distr., Bastchelakskij Mt. Range, Zagrikha Mt., 30 km NEE of Sentelek, 2000 m a.s.l., mountain tundra, 28.06.2000, G.N. Azarkina leg.

Diagnosis. By the shape of lamella (Fig. 54) it is close to the nominative subspecies but differs by the following characters: aedeagus narrowed to its base (Fig. 29), DA2 small, LB2 strongly protruded (Figs. 93, 94, 105, 106). *N. sajana sarlyk* also has a narrowed aedeagus, but ssp. *sitnikovi* can be separated from it by the small aedeagus, almost straight lamella and not protruded LB3.

Distribution. The new subspecies is only known from the type locality: Bastchelakskij Mt. Range (Fig. 135-F). It inhabits the extreme north-western part of the species range.

Etymology. The subspecies is named after Mr P.S. Sitnikov, our colleague from the Tyumen Regional Museum of Local Lore.

***Nebria arinae* sp. n.**

This new species includes two subspecies.

Description. Body dark-lurid to black-brown or piceous, upper surface without metallic reflection. Legs dark brown or completely red. Vertex with two small and distinctly separated (dark specimens) or large closed red spots. Antennae long and slender, surpassing the middle of the elytra in both sexes; scape elongate and slightly widened anteriorly, with a subapical seta (Figs. 11, 12). Pronotum (Fig. 5) cordate with hind angles slightly acute or right, being markedly sinuate posteriorly. Peripheral parts of pronotum finely punctate, sometimes rugose.

Margination of elytral base slightly sinuate jointed with lateral margin at very obtuse angle or arcually.

Elytral discal setiferous pores broadly foveate, interval 3 with 3 to 6 pores; interval 5 poreless, rarely with 1 pore; interval 7 poreless or with 1 pore, rarely with 3 pores. Striae deep, distinctly punctate. Abdominal sternites 3 to 5 with two or three irregular rows of 11-18 setae at middle, rarely sternite 5 with only one row of posterior paramedial setae. Base of hind coxa with 3 or 4 setae.

Aedeagus weakly curved, with shallow longitudinal impression on basal half of right side (Fig. 34). Lamella, slightly curved ventrally, with straight dorsal side (in lateral aspect), rounded at apex (Figs. 57-61).

Endophallus small, with indistinctly limited basal and apical parts (Figs. 113-119). Dorso-basal protuberances (DB) short (L3 less than L1) (Table 2). Basal part without additional bulbs or with small bulb LB2. Apical part with large but indistinctly limited DA1 and small LA1. DA2 present in *ssp. zinchenkoi* only.

Diagnosis. By the specific shape of endophallus with no protruding DB (Figs. 113-119), and the lamella with straight dorsal side, this species can be easily distinguished from the other species of the group. A new species is sympatric in distribution with the closely related *N. baenningeri* nom. nov. (see below). It differs from the latter species by the brown coloration without metallic lustre and more elongate antennae – LAN/WP=3.74-4.13 in males and 3.50-3.94 in females (Table 2). It can be separated from *N. baenningeri baenningeri* and *N. baenningeri katunensis* according to the more elongate scape (Figs. 11, 12). According to the abdominal chaetotaxy and coloration, *N. arinae* sp. n. is also similar to *N. roddei* sp. n. (see below), and differs by the large elytral discal setiferous pores, scape, possessing only one setae, and less punctured elytral striae.

Habitats. The species occurs in stony places in the alpine zone about 1700-2500 m a.s.l., usually near snow patches. Immature beetles were found at the beginning of August.

Distribution. Distributed in western Altai, north of Bukhtarma River (Fig. 135-L, M).

Etymology. The species is named after Arina Viktorovna Shilenkova.

***Nebria arinae arinae* ssp. n.**

Holotype: male (SZMN), Altai, Kholzun Mt. Range, the upper stream of left tributary of Bannaya River, 2000-2250 m a.s.l., mountain tundra, 13-14.06.1999, A. & R. Dudko leg.

Paratypes: 24 specimens (SZMN, ZISP, KBIN, MPU) collected together with holotype; 1 male (SZMN), western Altai, Ivanovskij Mt. Range, 10 km S of Leninogorsk, Prokhdnoj Belok Mt., mountain tundra, near snow edge, 1900-2000 m a.s.l., 31.05.1996, R. Dudko leg.; 9 males, 2 females (SZMN, ISU), idem, 15 km SE of Leninogorsk, W slope of Rossypnoj Belok Mt., mountain

tundra, stones, 2000 m a.s.l., 1.06.1996, R. Dudko leg.; 10 males, 2 females (SZMN), the same locality, the top of the Rossypnoj Belok Mt., 2300 m a.s.l., 2.06.1996, R. Dudko & A. Vorontsov leg.; 2 males, 3 females (SZMN), idem, 20 km SE of Leninogorsk, left source of Gromotukha River, 1500 m a.s.l., larch forest, 4-5.06.1996 R. Dudko & A. Vorontsov leg.; 5 males, 3 females (SZMN, ISU), idem, 5 km SW of Vysheivanovskij Belok Mt., 2000-2400 m a.s.l., mountain tundra, S slope, 6-7.06.1996, R. Dudko leg.; 1 male, 1 female (SZMN), idem, 3 km W of Vysheivanovskij Belok Mt., 2500 m a.s.l., mountain tundra, 7.06.1996, R. Dudko leg.; 1 male (ZISP), western Altai, S branches of Koksa Mt. Range, Lyamin Belok Mt., 2000 m a.s.l., 16.08.1986, I. Kabak leg.

Diagnosis. It differs from the *ssp. zinchenkoi* by the presence of the only dorso-apical bulb DA1 (Figs. 113-116). Scape relatively longer (Fig. 11), elytral striae more elevate.

Variability. Populations from Kholzun (Figs. 113, 114) and Ivanovskij Mt. Ranges (Figs. 115, 116), slightly differ in proportions of some endophallic bulbs. Specimens from Kholzun have legs with darker coloration. For the exact definition of these populations, the investigation of serial material from intermediate localities is needed.

Distribution. Distributed in western Altai and inhabit the most part of the species ranges (Fig. 135-L).

***Nebria arinae zinchenkoi* ssp. n.**

Holotype: male (SZMN), western Altai, Ivanovskij Mt. Range, 20 km SSW of Leninogorsk, Cherepanovskij Belok Mt., 1700 m a.s.l., alpine meadow, 7.08.1997, R. Dudko & V. Zinchenko leg.

Paratypes: 3 males, 1 female (SZMN), collected together with holotype, 1 male (SZMN), idem, 17 km S of Leninogorsk, Serzhinskij Belok Mt., 1800-2000 m a.s.l., alpine meadow, 8.08.1997, R. Dudko & V. Zinchenko leg.

Diagnosis. It can be separated from the nominative subspecies by the presence of additional dorso-apical bulb DA2, and very small DB (L3/L=0-10) (Figs. 117-119, Table 2). Scape somewhat shorter (Fig. 12), intervals of elytra flatter, the seventh interval usually with one or two setiferous pores. Body size average smaller, the length of males is 9.0-9.8 mm.

Distribution. Distributed in western branches of Ivanovskij Mt. Range: Cherepanovskij Belok and Serzhinskij Belok Mts. (Fig. 135-M).

Etymology. This subspecies is named after Mr V.K. Zinchenko, our colleague from the Siberian Zoological Museum.

***Nebria roddi* sp. n.**

Holotype: male (SZMN), Southern Altai, south part of Katun' Mt. Range, 5 km SE of Rakhmanovskiye Klyuchi, 2500 m a.s.l., alpine meadow, stones, 28.06.1997, R. Dudko & V. Zinchenko leg.

Paratypes: 74 specimens (SZMN, ZISP, KBIN, MPU, ISU), collected together with holotype; 1 male (SZMN), idem, N of Rakhmanovskiye Klyuchi, 2100-2500 m a.s.l., alpine meadow, 26.06.1997, R. Dudko & V. Zinchenko leg.

Description. Body (Fig. 2) dark brown or piceous, upper surface without metallic reflection. Legs dark brown, tibiae and especially tarsi lighter. Vertex with two large closed red spots. Antennae long and slender, reaching the basal third of elytra in females and almost reaching the middle of elytra in males; scape relatively short, slightly widened anteriorly, with two subapical setae (Fig. 13).

Pronotum (Fig. 3) cordate with hind angles right or slightly acute, being slightly sinuate posteriorly. Lateral reflection relatively wide. Peripheral parts of pronotum markedly punctate. Lateral sides of prosternum rarely punctulate in posterior part.

Margination of elytral base straight or slightly sinuate jointed with lateral margin arcually or very obtuse angle. Elytral discal setiferous pores small, interval 3 with 2 to 5 (usually 4) pores; interval 5 and 7 poreless or very rarely with 1 pore. Striae deep, roughly punctured. Abdominal sternites 3 to 5 with two or three irregular rows of 13-24 setae in middle (Fig. 7). Base of hind coxa with 3 or 4 setae.

Aedeagus small, sometimes with shallow longitudinal impression on basal half in right side (Fig. 35). Lamella wide, slightly curved ventrally, with curving dorsal side, rounded at apex (Figs. 62-65).

Endophallus small, with distinctly limited basal and apical parts (Figs. 120-122). Additional bulbs LB2 present in base of basal part. Indistinctly limiting DA1, strongly protruding DA2 and small oval LA1 present in apical part. Angle A2 acute or right.

Diagnosis. It is the most distinguishable species in the *Nebria mellyi* group: discal setiferous pores of elytra are small, sides of the pronotum less sinuate, scape is relatively short and possessing two subapical setae, elytral striae roughly punctured, and the endophallus with very specific shape.

Habitats. The species occurs in stony places in the alpine zone. Among species of *Nebria mellyi* group, *N. roddi* is the most petrophilic.

Distribution. The species is known from the type locality: Katun' Mt. Range, near Rakhmanovskiye Klyuchi (Fig. 135-N).

Etymology. The species is named after E.G. Rodd (1871-

1933), entomologist and researcher of Altai. The part of his insect collection kept now in SZMN.

***Nebria baenningeri* nom. nov.**

Nebria escheri MOTSCHULSKY (loc. class. – "Altai"), Ins. Siber. 1844: 127 (non HEER).

Nebria mellyi var. *escheri* BÄNNINGER, 1921, Ent. Mitteil., 10, 5: 153.

Nebria mellyi ab. *escheri* BÄNNINGER 1925, Ent. Mitteil., 14, 3-4: 264.

Nebria mellyi ab. *banningeri* CSIKI, 1927: 369.

Nebria mellyi ab. *escheri* SHILENKOV, 1975: 837.

Nebria mellyi ab. *escheri* KRYZHANOVSKIJ & al., 1995: 31.

Redescription. Body black, upper surface with slight to distinct bluish, violet or greenish metallic reflection or lacking it. Vertex with two small distinctly separated red spots. Legs dark, with tibiae and tarsi lighter, rare legs completely red-brown. Antennae long and slender, reaching the basal third of elytra in females and almost the middle of elytra in males; scape more or less elongate and slightly widened anteriorly, with one or two subapical setae (Figs. 14, 15).

Pronotum (Fig. 4) cordate with hind angles slightly acute, being markedly sinuate posteriorly. Peripheral parts of pronotum finely punctate, sometimes rugose.

Margination of elytral base slightly sinuate jointed with lateral margin at obtuse angle. Elytral discal setiferous pores broadly foveate, interval 3 with 3 to 6 pores; interval 5 poreless, rarely with 1 pore; interval 7 poreless or with 1 to 4 pores. Striae deep, distinctly punctate. Abdominal sternites 3 to 5 with two or three irregular rows of 11-25 setae at middle. Base of hind coxa with 2 or 3 setae.

Aedeagus with shallow but distinct longitudinal impression on basal half in right side (Figs. 31-33). Lamella distinctly curved ventrally, rounded at apex (Figs. 66-74).

Endophallus with a many additional bulbs (Figs. 123-134). DB1, DB2, LB1 and LB2 present in basal part, DA1, large LA2 and VA1 present in apical part. Sometimes DB1, LB2, DA1 and VA1 lacking or indistinctly limited. The rate of some bulbs development depends on the geographic variability.

Habitats. The species occurs in the alpine zone at about 1600-2800 m a.s.l., usually near snow patches. Immature beetles were found at the beginning of June; at the end of July and the beginning of August only immature specimens occur.

Distribution. Distributed in western and central Altai (Fig. 135-H-K).

The species is geographically variable and includes three subspecies.

***Nebria baenningeri baenningeri* nom. nov.**

Lectotype of *Nebria escheri* MOTSCHULSKY, male, collection of V.I. Motschulsky (ZMUM), designated here, is supported by labels: 1) "Altai" – manuscript labels on white paper; 2) "Nebria ledereri Kdm Alp. Altai" – manuscript labels on white paper; Paralectotype (ZISP), provided with following labels: 1) "Lederii Kdm."; 2) "Sibir. Altaica" – label on rose paper; paralectotype (ZISP), with labels: 1) "N ledererii Kdm.", 2) "Nebria Mellyi Gebl. Siber. occ."

Other material includes 355 specimens from localities given below.

Kazakhstan. Western Altai, Ivanovskij Mt. Range, 5 km NW of Vysheivanovskij Belok Mt., 1800 m a.s.l., alpine meadow, 8.06.1996, R. Dudko leg. (3 male, 4 female); idem, 3 km W of Vysheivanovskij Belok Mt., 2500 m a.s.l., mountain tundra, 7.06.1996, R. Dudko leg. (26 males, 8 females); idem, 5 km SW of Vysheivanovskij Belok Mt., 2000-2400 m a.s.l., mountain tundra, south slope, 6-7.06.1996, R. Dudko leg. (1 female); idem, the top of Rossypnoj Belok Mt., 2300 m a.s.l., 2.06.1996, R. Dudko & A. Vorontsov leg. (5 males, 1 females); idem, 4 km E of the top of Rossypnoj Belok Mt., 2100 m a.s.l., 2.06.1996, R. Dudko leg. (38 males, 6 females); idem, 15 km SE of Leninogorsk, W slope of Rossypnoj Belok Mt., mountain tundra, 2000 m a.s.l., 1.06.1996, R. Dudko leg. (3 males, 2 females); idem, 32 km E of Leninogorsk, near Vysheivanovskij Belok Mt., 2500 m a.s.l., 14.08.1986, I. Kabak leg. (1 male, 1 female); idem, 17 km S of Leninogorsk, Serzhinskij Belok Mt., 1800-2000 m a.s.l., alpine meadow, 8.08.1997, R. Dudko & V. Zinchenko leg. (15 specimens);

South-western Altai, Kholzun Mt. Range, the upper stream of Tegerek River, 1600-1900 m a.s.l., 15.07.1983, I. Sokolov leg. (5 males, 3 females); idem, Krasnoyarskij Pass, snow zone, 5.07.1925, V. Lebedev leg. (1 male, 2 females); idem, Kozlushka, Bukhtarma Distr., 8.07.1925, V. Lebedev leg. (1 male); south-western Altai, Listvyaga Mt. Range, Tesninskij Belok Mt., 2000-2300 m a.s.l. 28-29.07.1997, R. Dudko & V. Zinchenko leg. (4 males, 13 females).

Russia. Altai, Kholzun Mt. Range, the upper stream of left tributary of Bannaya River, 2000-2250 m a.s.l., mountain tundra, 13-14.06.1999, A. & R. Dudko leg. (212 specimens).

Diagnosis. The upper surface of the nominative subspecies is usually with metallic reflection, scape shorter (in comparison with ssp. *korgonica*), and usually possesses only one preapical seta (Fig. 14) (in large series from Kholzun Range we found five specimens with two preapical setae on one side, and two specimens with a pair of setae on both sides); lamella wide, with curving dorsal margin; DB2 wide and slightly protruding; angle A1 distinct (Figs. 123-128). Unlike the ssp. *katunensis*, dorso-basal protuberances DB and VB are strongly protrud-

ing, apical part small (L more than L4), angle A3 very acute, VA1 indistinctly limited.

Distribution. Distributed in western Altai: Ivanovskij, Kholzun and Listvyaga Mt. Ranges (Fig. 135-H).

***Nebria baenningeri katunensis* ssp. n.**

Holotype: male (SZMN), Southern Altai, S of Katun' Mt. Range, N of Rakhmanovskiye Klyuchi, 2100-2500 m a.s.l., alpine meadow, 26.06.1997, R. Dudko & V. Zinchenko leg.

Paratypes: 212 specimens (SZMN, ZISP, KBIN, ISU, ZMUM), collected together with holotype; 67 specimens (SZMN), idem, 5 km SE of Rakhmanovskiye Klyuchi, 2500 m a.s.l., alpine meadow, 28.06.1997, R. Dudko & V. Zinchenko leg.; 15 specimens (ZISP, MPU, ISU), idem, near Rakhmanovskiye Klyuchi, 2600 m a.s.l., 6-7.08.1986, I. Kabak leg.; 1 male (SZMN), idem, near Belukha Mt., the upper stream of the Katun' and Berel' Rivers, 1700-3000 m a.s.l., 25.07.1995, Yu. Zinchenko leg.; 177 specimens (SZMN), Altai, N slope of Katun' Mt. Range, 12-15 km S of Multa, 2300-2800 m a.s.l., mountain tundra, A. & R. Dudko leg.

Diagnosis. It differs from the others subspecies by the endophallus, which has a relatively long apical part and short basal part ($L4/L=0.86-1.00$), VB weakly protruding ($L1/L=0.05-0.11$), additional bulb VA1 larger and distinctly limited (Figs. 132-134, Table 2). From the nominative subspecies differs by the black coloration of body, without metallic reflection.

Distribution. Distributed in Katun' Mt. Range, occurring in the extreme eastern part of the species range (Fig. 135-K).

***Nebria baenningeri korgonica* ssp. n.**

Holotype: male (ZISP), Altai, Korgon Mt. Range, the upper stream of the Mokhnatjy Brook (right tributary of the Kumir River), 1750-2000 m a.s.l., 10-24.07.1984, V. Shilenkov leg.

Paratypes: 24 specimens (ZISP, ISU, SZMN), collected together with holotype; 126 specimens (SZMN, ZISP, ISU, KBIN), Altai territory, Tigirek Mt. Range, 12 km S of Tigirek village, upper stream of Malyi Tigirek and Irkutka Rivers, 1500-1950 m a.s.l., 19-21.06.2000, R. Dudko leg.; 25 specimens (CCH), idem, A. Chemeris leg.

Diagnosis. *Nebria baenningeri korgonica* differs greatly from the other subspecies by its scape, which is longer, slender and possesses two subapical setae (Fig. 15). The endophallus structure *N. baenningeri korgonica* is similar to the nominative subspecies, and differs by the following characters: DB2 narrow and strongly protruding, DB jointed with aedeagus arcuately or at very obtuse angle

A1 (Figs. 129-131). The upper surface without metallic reflection, rarely with faint greenish metallic reflection.

Variability. Specimens from Tigirek Mt. Range have legs and antennae with lighter coloration: usually scape and legs entirely red. Specimens from Korgon Mt. Range have longer lamella (Figs. 73, 74), larger body size and darker coloration of legs and antennae.

Distribution. Distributed in western Altai: Korgon and Tigirek Mt. Ranges, where it occurs in the extreme northern part of the species range (Fig. 135-I).

ECOLOGY

All representatives of *Nebria mellyi* group occur in alpine and mountain tundra belt at altitudes about 1600-2900 m and can usually be found in stony places ("kurumy") near the snow patches. In spring time, when the weather is quite wet, beetles were very often found far from the snow. Immature specimens of *N. mellyi* were collected during the second half of May and not in September. Young and old specimens of *N. baenningeri* and *N. arinae* can be found at the beginning of June; at the end of July and the beginning of August only immature specimens occur.

We have no data on the phenology of *N. roddi* and *N. sajana*. Many species of this group are allopatric in their range, but *N. baenningeri* and *N. arinae* in western Altai and *N. baenningeri katunensis* and *N. roddi* in the Katun' Mountainous Range are spread sympatric. *N. arinae* and *N. roddi* species prefer more stony places than *N. baenningeri*.

ZOOGEOGRAPHY

The range of *Nebria mellyi* group occurs in the territory of the Altai mountains, Kuznetskij Alatau and Western Sayan (Fig. 135). It is interesting that species with a good developed abdominal chaetotaxy (*N. baenningeri*, *N. arinae*, *N. roddi*) distributed in south-west part of the group range: western and central Altai; but species with a weak chaetotaxy, possessing one row of 4 to 9 setae on 3 to 5 abdominal sternites (*N. mellyi*, *N. sajana*) distributed in the north-east: northern part of Altai, Kuznetskij Alatau and Western Sayan.

N. mellyi distributed is: Kuznetskij Alatau, north-eastern Altai. It is adjacent to the *N. sajana* ranged: northern part of Altai and Western Sayan. These areas are adjacent to north-eastern Altai, but the two species have not been found sympatric. *N. sajana* is faintly variable geographically in the territory of Western Sayan, but 5 subspecies from the different mountainous ranges were described in Altai part of the area due to the extreme variability of beetles. Analogous, *N. mellyi* is relatively constant in the territory of Kuznetskij Alatau and Gornaya Shoria but it is represented by good subspecies, *N. mellyi teletskiana*, in north-eastern Altai.

Species of the west branch: *N. baenningeri*, *N. arinae*

and *N. roddi* have local areas. *N. baenningeri* is the most widespread: in the northern part of the area it is represented by subspecies *N. baenningeri korgonica*, and in the south-east (Katun' Mt. Ranges) by *N. baenningeri katunensis*. *N. arinae* is sympatric with *N. baenningeri*. *N. roddi* is known from the only locality in Katun' Mt. Range where it was collected together with *N. baenningeri katunensis*.

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References

- CSIKI, E. 1927. Pars 92. Carabidae: Carabinae II. Pp. 315-622. In: W. Junk and S. Schenkling (editors), *Coleopterorum Catalogus* 1. W. Junk, Berlin, 345 pp. + 648 pp. [1926-33].
- KAVANAUGH, D.H. & SHILENKOV, V.G. 1996. A remarkable new species of *Nebria* (Coleoptera: Carabidae: Nebriini) from North Korea. *Proceedings of the California Academy of Sciences*, 49 (5): 151-160.
- KRYZHANOVSKIJ, O.L., BELOUSOV, I.A., KABAK, I., KATAEV, B.M., MAKAROV, K.V. & SHILENKOV, V.G. 1995. A Checklist of the Ground-Beetles of Russia and Adjacent Lands (Insecta, Coleoptera, Carabidae). Pensoft Publishers, Sofia-Moscow; 271 pp.
- LEDOUX, G. & ROUX, Ph. 1989. *Nebria* (*Pseudonebriola*) *crassiforma*, espèce nouvelle de Turquie appartenant à un sous-genre nouveau (Col. Nebriidae). *Bulletin de la Société entomologique de France*, 93 (7-8): 229-232.
- SHILENKOV, V.G. 1975. [A taxonomic review of the genus *Nebria* Latr. (Coleoptera, Carabidae) from Siberia and the USSR Far East]. *Entomologicheskoye obozreniye*, 54 (4): 830-845. [In Russian]
- SHILENKOV, V.G. 1976. [Ground-beetles of the genus *Nebria* Latr. (Coleoptera, Carabidae) of the Mongolian People's Republic and the adjacent regions]. In: *Nasekomyye Mongolii*, Leningrad, 4: 115-132. [In Russian]
- SHILENKOV, V.G. 1983. To the knowledge of Nebriini (Coleoptera, Carabidae) from Northern Korea. *Folia entomologica Hungarica*, 44 (2): 307-314.

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