Russian Entomol. J. 23(3): 169–178

A revision of genus *Xerobion* Nevsky, 1928 (Homoptera: Aphididae)

Ревизия тлей рода *Xerobion* Nevsky, 1928 (Homoptera: Aphididae)

R.Kh. Kadyrbekov
Р.Х. Кадырбеков

Institute of Zoology Ministry of Education and Sciences of Kazakhstan Republic, Academgorodok, Al-Farabi av., 93, Almaty 050060, Kazakhstan, E-mail: rustem61@inbox.ru

Институт зоологии Министерства образования и науки Республики Казахстан, Академгородок, проспект Аль Фараби, 93, Алматы 050060, Казахстан.

KEY WORDS: Aphids, *Xerobion*, revision, new species, key.

КЛЮЧЕВЫЕ СЛОВА: тли, *Xerobion*, ревизия, определительный ключ.

ABSTRACT. Aphids from the genus *Xerobion* Nevsky, 1928 has been revised to include 18 species. Three new species from the Kazakhstan are described: *X. barsukense* Kadyrbekov **sp.n.** from *Helichrysum arenarium*, *X. compositae* Kadyrbekov **sp.n.** from *Cousinia perovskiensis* and *Cirsium arvense*, *X. desertorum* Kadyrbekov **sp.n.** from *Helichrysum arenarium*. New synonyms are installed. *X. artemisiae* (Narzikulov, 1949), *X. terraealbae* Ivanovskaja, 1959) are new synonyms of the *X. cinae* (Nevsky, 1928). *X. brutii* (Barbagallo, 1996), *X. georgii* (Mier et Nieto, 1991) are new synonyms of the *X. caspicae* (Bozhko, 1963). *X. tashevella* (Eastop et Hille Ris Lambers, 1976) is new synonym of the *X. lambersi* (Taschev, 1961) **stat. rest**. Key to apterous viviparous females of all known species *Xerobion* is compiled.

РЕЗЮМЕ. Проведена ревизия тлей рода *Xerobion* Nevsky, 1928, включающего 18 видов. Описаны три новых вида из Казахстана: *X. barsukense* Kadyrbekov **sp.n.** с бессмертника (*Helichrysum arenarium*), который близок к *X. camphorosmae* (Taschev, 1961), но отличается от него соотношениями шпица к основанию шестого членика усиков (0,75–1,00 против 0,9–1,2), трубочек к хвостику (0,59–0,65 в сравнении с 0,45–0,55), хвостика ко второму члению задней лапки (1,0–1,1 против 0,83–0,98) и иным растением-хозяином.

X. compositae Kadyrbekov **sp.n.** с кузинии (*Cousinia perovskiensis*) и бодяка (*Cirsium arvense*), который близок к *X. lambersi* (Taschev, 1961) по отсутствию воскового налёта на теле и соотношению последнего членика хоботка и второго членика задней лапки, но отличается пропорцией третьего членика усиков к шестому (1,0–1,4 в сравнении с 0,7–1,0), более длинными лобными волосками, цветом бёдер (на препаратах) и иным растением-хозяином.

X. desertorum Kadyrbekov **sp.n.** с бессмертника (*Helichrysum arenarium*), который близок к *X. alakuli* (Juchnevitsh, 1974) по длинным лобным волоскам, но отличается по форме хвостика, его соотношению с длиной тела (0,045–0,053 в сравнении с 0,055–0,065) и иным растением-хозяином.

Установлены новые синонимы. *X. artemisiae* (Narzikulov, 1949), *X. terraealbae* Ivanovskaja, 1959) — новые синонимы *X. cinae* (Nevsky, 1928). *X. brutii* (Barbagallo, 1996), *X. georgii* (Mier et Nieto, 1991) — новые синонимы *X. caspicae* (Bozhko, 1963). *X. tashevella* (Eastop et Hille Ris Lambers, 1976) — новый синоним *X. lambersi* (Taschev, 1961) **stat.rest.** Составлен определительный ключ по бескрылым живородящим самкам всех известных видов *Xerobion*.

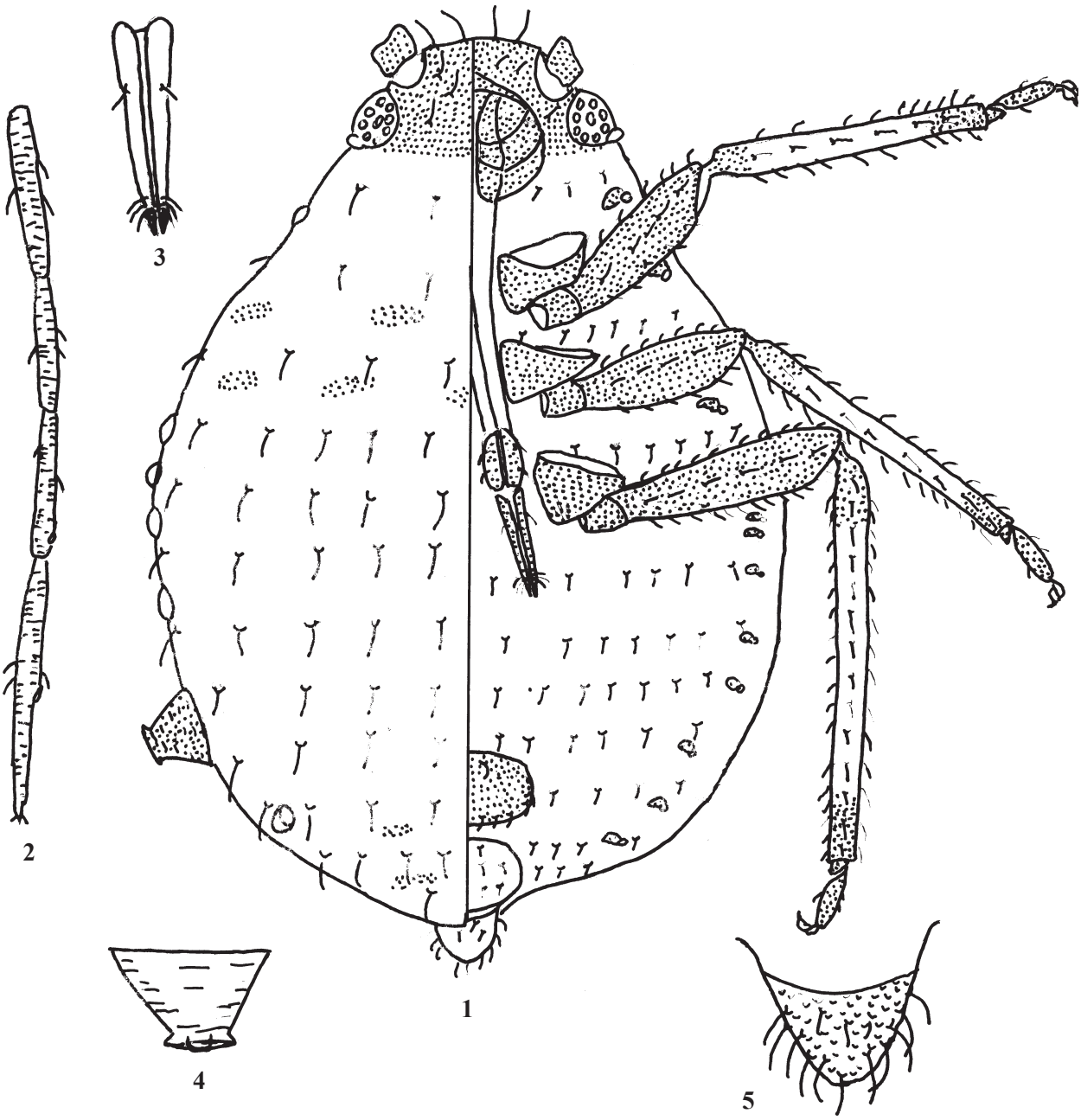
Introduction

Xerobion is the South Palaearctic genus with 18 species in world fauna [Blackman & Eastop, 2006; Kadyrbekov, 2001; G. & M. Remaudière, 1997]. This genus includes 3 species on Chenopodiaceae: *X. camphorosmae* (Taschev, 1961), *X. eriosomatinum* Nevsky, 1928, *X. juchnevitchae* Smajlova, 1974 initially. Later subgenus *Absinthaphis* Remaudière et Stary, 1973 (genus *Aphis*) on Asteraceae was synonymized with *Xerobion* [Kadyrbekov, 2001]. Now *Xerobion* includes species with short volcano-shaped siphunculi and triangular cauda. All of them are narrow oligophagous or monophagous on plants of the Asteraceae and Chenopodiaceae in the arid zone of the Palearctic.

Materials and methods

We studied the types of *Xerobion artemisiae* (Narzikulov, 1949), *X. cinae* (Nevsky, 1928), *X hirsutum* (Nevsky, 1929), *X. terraealbae* (Ivanovskaja, 1959) from the collection of the Zoological Institute RAN (Saint-Petersburg, Russia) and paratypes of *X. caspicae* (Bozhko, 1963), *X. inthybi* Bozhko, 1963 from the collection of Bozhko (Kharkov, Ukraine). Type series

of *X. alakuli* (Juchnevitsh, 1974), *X. juchnevitchae* Smajlova, 1974 are stored in the collection of the Institute of Zoology on Republic of Kazakhstan (Almaty). Paratypes of *X. album* (Remaudière et Davatchi, 1959), *X. georgii* (Mier et Nieto, 1991), *X. judenkoi* (Szelegiewicz, 1959), *X. hortobagyi* (Szelegiewicz, 1978), *X. pannonica* (Szelegiewicz, 1978) has kindly sent by the Remaudière (Museum national d'Histoire naturelle, Paris, France). Besides, a lot of specimens *X. alakuli* (Juch.), *X. cinae* (Nevs.), *X. camphorosmae* (Tasch.), *X. eriosomatinum* Nevs., *X. caspicae* (Bozh.), *X. lambersi* (Tasch.), *X. judenkoi* (Szel.), *X. pannonica* (Szel.) from the collection of Institute of Zoology on Republic of Kazakhstan (Almaty) have also been studied. Original descriptions [Barbagallo, 1996; Bozhko, 1963; Ivanovskaja, 1960; Mier Durante & Nieto Nafria, 1991; Nevsky, 1929, 1937; Juchnevitsh, 1974; Garcia Prieto & Sanchis Segovia, 1998; Remaudière & Davatchi, 1959; Smajlova, 1974; Szelegiewicz, 1959, 1978; Taschev, 1961] of all the known species have been studied also.



Figs 1–5. *Xerobion barsukense* Kadyrbekov **sp.n.**, apterous viviparous female: 1 — habitus; 2 — III–VI antennal segments; 3 — ultimate rostral segment; 4 — siphunculus; 5 — cauda.

Рис. 1–5. *Xerobion barsukense* Kadyrbekov **sp.n.**, бескрылая живородящая самка: 1 — габитус; 2 — III–VI членики усиков; 3 — последний членик хоботка; 4 — трубочки; 5 — хвостик.

Form of ultimate rostral segment, number of marginal tubercles, natural color, color on slides, presence or absence of wax powder and secondary rhinariae, long of frontal hairs, number of hairs on cauda and 8th tergite, the ratios of 3rd antennal segment to 6th one and processus terminalis, processus terminalis to the base of 6th antennal segment, ultimate rostral segment to second segment of hind tarsus, siphunculi to body and cauda, cauda to body and second segment of hind tarsus are used for the preparation of key to all known species.

Holotypes and paratypes of described taxa are deposited in the collection of Institute of Zoology (Almaty, Kazakhstan). Part of paratypes is kept in the Zoological Institute of RAN (Saint-Petersburg, Russia).

All measurements are given in millimeters.

Results

Xerobion barsukense Kadyrbekov **sp.n.**
Figs. 1–5

TYPE MATERIAL. Holotype: 1 apterous viviparous female, slide No 1874, *Helichrysum arenarium,* South-West Kazakhstan, Aral region, Big Barsuki desert, 90 km to South Chelkar town, 06.06.1990, R.Kh. Kadyrbekov; paratypes: 2 apterous viviparous females together with holotype.

DIAGNOSIS. New species relates to *X. camphorosmae* (Taschev, 1961). It differs by having the ratios of processus terminalis to the base of 6th antennal segment (0.75–1.00 versus 0.90–1.20), siphunculi to cauda (0.59–0.65 in comparison 0.45–0.55), cauda to the second segment of hind tarsus (1.00–1.10 against 0.83–0.98) and other host plant.

Apterous viviparous female (by the 3 specimens). Body broad oval, 1.38–1.52 (Fig. 1). Cuticle reticulated. Frons convex. Frontal setae (0.039–0.045) 2.3–3.0 of basal diameter of 3rd antennal segment. Antennae six-segmented, 0.48–0.50 of body length. Third segment 1.5–1.6 of 4th, 1.6–2.0 of processus terminalis and 0.76–0.86 of 6th segment. Processus terminalis 0.75–1.0 of base of 6th segment (Fig. 2). Fourth segment 0.83–0.92 of 5th. Secondary rhinariae are absent. Hairs on 3rd segment (0.011–0.017) 0.8–1.0 of its basal diameter. Clypeus normal, rostrum reaches behind to middle coxae. Ultimate rostral segment (Fig. 3) elongated, 1.50–1.65 of second segment of hind tarsus, with 2 accessory hairs. Siphunculi short, volcano-shaped with flanges, about 0.047–0.056 of body length, 0.59–0.65 of cauda length, 0.66–0.75 of its maximal width, 0.63–0.66 of second segment of the hind tarsus (Fig.4). Cauda triangular, 0.080–0.086 of body length, 0.85–0.92 of its basal width, 1.00–1.06 of second segment of hind tarsus, with 12–16 hairs (Fig. 5). Marginal tubercles gentle, hemispherical, developed on prothorax, 1st –4th and 7th tergites. Diameter of tubercle on 7th tergite (0.017) 0.6–0.7 of 1st one and 1.2 of basal diameter of 3rd antennal segment. Hairs on 3–6 tergites (0.039–0.045) 2.3–3.0 of basal diameter of 3rd antennal segment. 8th tergite with 2–3 hairs. Genital plate oval with 2–3 hairs on disc and 10–12 ones along its posterior margin. Legs normally developed. Trochanter hair of the hind leg (0.034–0.039) 0.75–0.85 and longest hair on the external side of hind femur (0.022–0.028) 0.45–0.65 of trochantro-femoral suture. First tarsal segments with 3:3:2 hairs.

Color on slide: head, 1st, 2nd, 5th, 6th antennal segments, clypeus, 3rd–4th segments of rostrum, coxae, trochanters, femora, bases and apices of tibiae, tarsi, genital plate, dorsal spots and stripes on pro-, meso-, metathorax, 4–5th , 7–8th tergites brownish; siphunculi brown; cauda pale or light brownish.

Natural coloration: body dark-brown with wax powder; eyes dark-reddish; siphunculi blackish).

Measurement of holotype. Body 1.52; antennae 0.74–0.75: III 0.18, IV 0.12, V 0.13, VI 0.21–0.22 (0.12+0.09–0.10); siphunculi 0.078/0.117, 0.078/0.104; cauda 0.12/0.14; ultimate rostral segment 0.169; second segment of hind tarsus 0.117.

HOST PLANT. *Helichrysum arenarium* (L.) Moench. (Asteraceae).

BIONOMY. Aphids suck on flowers and shoots, visited by ants.

ETYMOLOGY. The name of species is derived from name of sandy desert where it was collected.

Xerobion compositae Kadyrbekov **sp.n.**
Figs 6–10

TYPE MATERIAL**.** Holotype: 1 apterous viviparous female, No940, *Cousinia perovskiensis,* Southern Kazakhstan, Zhambil Area, Western Tien-Shan, Karatau ridge, 10 km to South-West Zhanatas town, Ushbas river, H-600 m., 22.05.1988, R.Kh. Kadyrbekov; paratypes: 2 apterous viviparous females together with holotype, 9 oviparous females, slide No 134 (old series), *Cirsium arvense,* Central Kazakhstan, Karaganda Area, Zhanaarka district, Koksengir mountains, Taldymanak river, 17.09.1962, N.E. Smajlova.

DIAGNOSIS. New species is closed to *X. lambersi* (Taschev, 1961) by absence wax powder on the body and ratio of ultimate rostral segment to second segment of hind tarsus. It differs from this species by the proportion of third to six antennal segments (1.0–1.4 versus 0.7–1.0), mor long frontal hairs, color of femora (in slides) and other host plant.

Apterous viviparous female (by 3 specimens). Body broad oval, 1.48–1.63 (Fig. 6). Cuticle reticulated. Frons convex. Frontal setae (0.034–0.045) 2.0–2.5 of basal diameter of 3rd antennal segment. Antennae six-segmented, 0.43–0.49 of body length. Third segment 1.5–1.9 of 4th, 2.9–3.5 of processus terminalis and 1.0–1.25 of 6th segment. Processus terminalis 0.5–0.7 of base of 6th segment (Fig. 7). Fourth segment 0.95–1.10 of 5th. Secondary rhinariae are on 3rd (5–8), 4th (2–3), 5th (0–1) antennal segments. Hairs on 3rd segment (0.017) equal to its basal diameter. Clypeus normal, rostrum reaches to middle coxae. Ultimate rostral segment (Fig. 8) stiletto-shaped 1.0–1.1 of second segment of hind tarsus, with 2 accessory hairs. Siphunculi very short, volcano-shaped with flanges, about 0.040–0.044 of body length, 0.65–0.71 of cauda length, 0.68–0.71 of its maximal width, 0.54–0.56 of second segment of the hind tarsus (Fig. 9). Cauda triangular, 0.47–0.64 of its basal width, 0.77–0.85 of second segment of hind tarsus, with 19–22 hairs (Fig. 10). Marginal tubercles gentle, hemispherical, developed on prothorax, 1st and 7th tergites. Diameter of tubercle on 7th tergite (0.022–0.028) 0.5–0.7 of 1st one and 1.0–1.2 of basal diameter of 3rd antennal segment. Hairs on 3–6 tergites (0.028–0.034) 1.7–2.0 of basal diameter of 3rd antennal segment. 8th tergite with 4–8 hairs. Genital plate oval with 2 hairs on disc and 6–7 ones along its posterior margin. Legs normally developed. Trochanter hair of the hind leg (0.034–0.045) 0.73–0.75 and longest hair on the external side of hind femur (0.028–0.039) 0.62–0.64 of trochantro-femoral suture. First tarsal segments with 3:3:2 hairs.

Color on slide: head, 1st, 2nd, 6th antennal segments, clypeus, 3rd –4th segments of rostrum, coxae, trochanters, femora, apices of tibiae, tarsi, genital plate, dorsal spots on

pro-, meso-, metathorax light brownish; siphunculi brown; cauda pale.

Natural coloration: body dark-green without wax powder; eyes dark-reddish; siphunculi blackish.

Measurements of holotype. Body 1.61; antennae 0.70–0.73: III 0.20–0.21, IV 0.11–0.12, V 0.10–0.12, VI 0.17 (0.10–0.11+0.06–0.07); siphunculi 0.065/0.091, 0.065/0.091; cauda 0.10/0.156; ultimate rostral segment 0.13; second segment of hind tarsus 0.117.

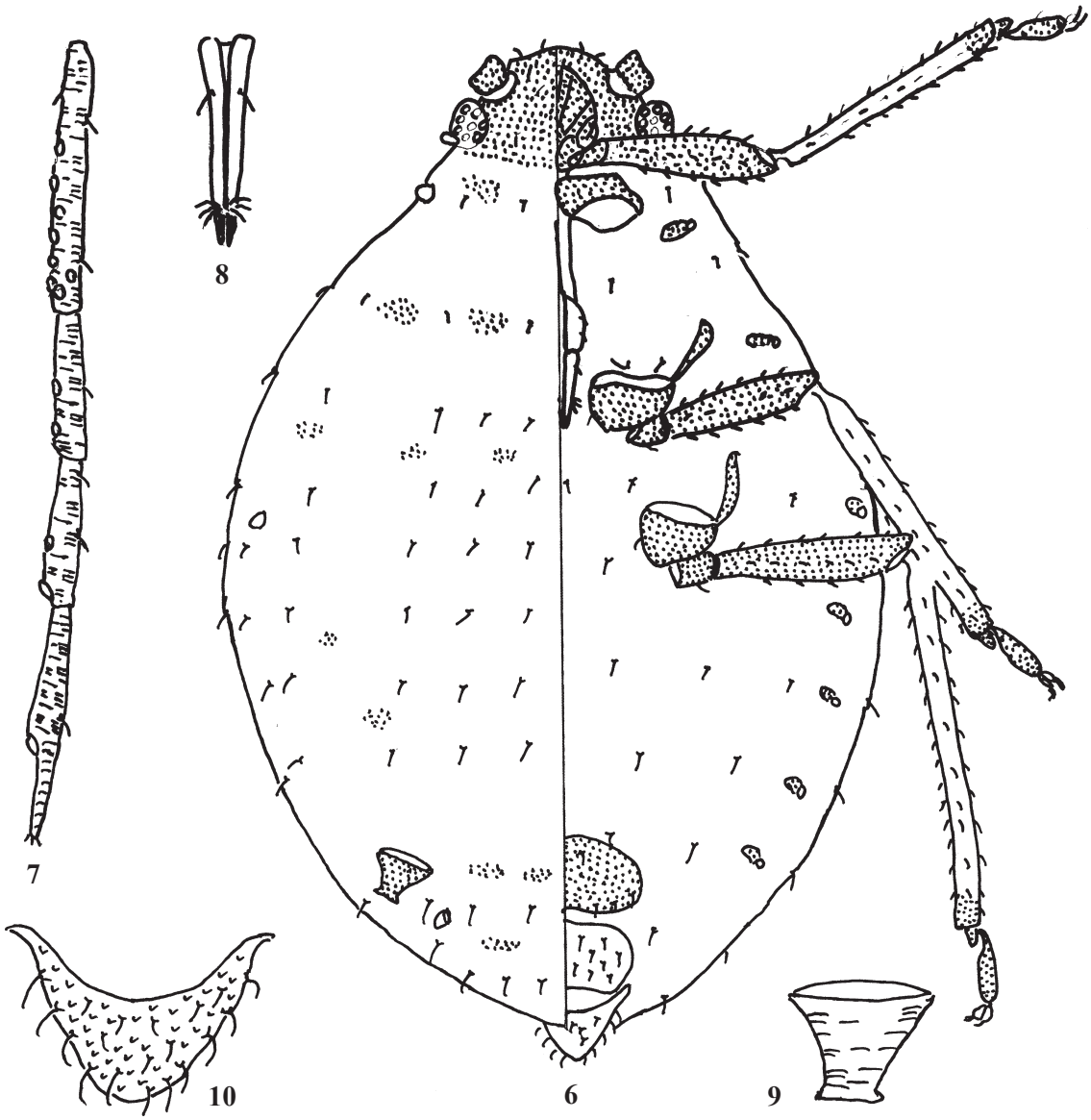
Oviparous female (by 9 specimens). Body broad oval, 1.81–1.96. Antennae six-segmented, 0.48–0.56 of body length. Third segment 3.1–3.9 of processus terminalis and 1.2–1.4 of 6th segment. Secondary rhinariae are only on 3rd (0–1) antennal segments. Ultimate rostral segment 0.9–1.0 of second segment of hind tarsus. Siphunculi about 0.70–0.75 of cauda length. Genital plate oval with 6–12 hairs on disc and 12–22 ones along its posterior margin. Hind tibiae with 100–150 pseudosensoriae. Other characters as apterous female.

Color on slide: head, 1st, 2nd, 6th antennal segments, clypeus, 3rd –4th segments of rostrum, coxae, trochanters, femora, apices of tibiae, tarsi, genital plate, dorsal spots on pro-, meso-, metathorax light brownish; siphunculi brown; cauda pale.

HOST PLANT. *Cirsium arvense* (L.) Scop., *Cousinia perovskiensis* (Bornm.) Juz. (Asteraceae).

BIONOMY. Aphids suck on the lower side of leafs, visited by ants.

ETYMOLOGY. The name of species is derived from name of sandy desert where it was collected.



Figs 6–10. *Xerobion compositae* Kadyrbekov **sp.n.**, apterous viviparous female: 6 — habitus; 7 — III–VI antennal segments; 8 — ultimate rostral segment; 9 — siphunculus; 10 — cauda.

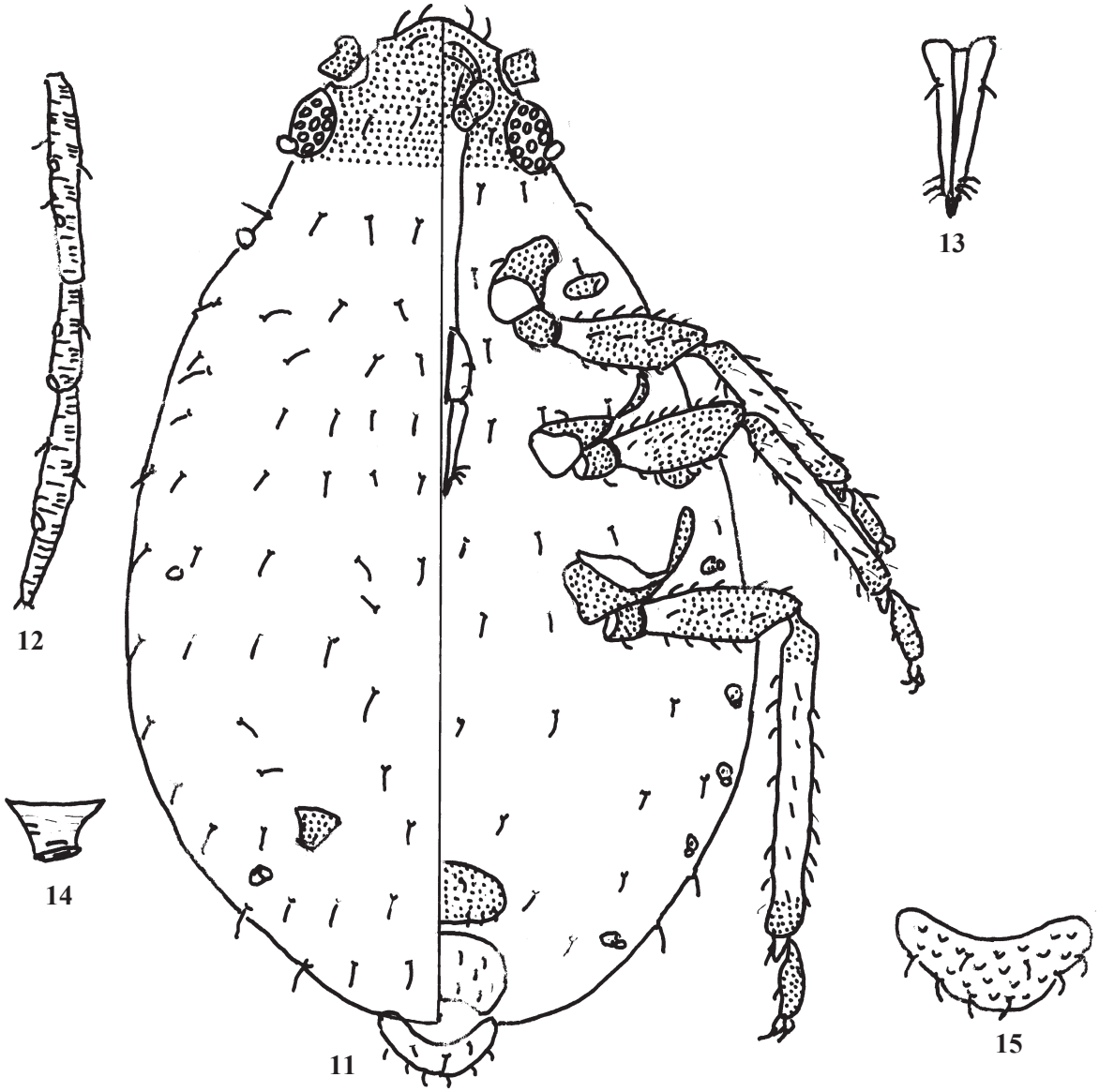
Рис. 6–10. *Xerobion compositae* Kadyrbekov **sp.n.**, бескрылая живородящая самка: 6 — габитус; 7 — III–VI членики усиков; 8 — последний членик хоботка; 9 — трубочки; 10 — хвостик.

Xerobion desertorum Kadyrbekov **sp.n.**
Figs 11–15

TYPE MATERIAL. Holotype: 1 apterous viviparous female, slide No 1876, *Helichrysum arenarium,* South-West Kazakhstan, Aral region, Big Barsuki desert, 90 km to South Chelkar town, 06.06.1990, R.Kh. Kadyrbekov; paratypes: 6 apterous viviparous females together with holotype.

Diagnosis. A new species is closed to *X. alakuli* (Juchnevitsh, 1974) by long of frontal hairs. It differs by the shape of cauda, its proportion to the body length (0.045–0.053 against 0.055–0.065) and other host plant.

Apterous viviparous female (by 7 specimens). Body oval, 0.99–1.22 (Fig. 11). Cuticle reticulated. Frons convex. Frontal setae (0.028–0.039) 2.5–3.5 of basal diameter of 3rd antennal segment. Antennae five-, six-segmented, 0.35–0.42 of body length. Third segment 1.75–2.15 of 4th, 1.5–2.8 of processus terminalis and 0.65–1.05 of 6th segment. Processus terminalis 0.50–0.75 of base of 6th segment (Fig. 12). Fourth segment 0.7–1.0 of 5th. Secondary rhinariae are on 3rd (0–2), 4th (0–1) antennal segments. Hairs on 3rd segment (0.011–0.017) 1.0–1.5 of its basal diameter. Clypeus normal, rostrum reaches to middle coxae. Ultimate rostral segment (Fig. 13) stiletto-shaped, 1.25–1.37 of second segment of hind tarsus, with 2 accessory hairs. Siphunculi very short, volcano-shaped with flanges, about 0.032–0.039 of body length, 0.60–0.75 of cauda length, 0.43–0.60 of its maximal width, 0.43 of second segment of the hind tarsus (Fig. 14). Cauda bluntly triangular, 0.045–0.053 of body length, 0.45–0.55 of its basal width, 0.57–0.71 of second segment of hind tarsus, with 8–10 hairs (Fig. 15). Marginal tubercles gentle, hemispherical, developed on prothorax, 1st and 7th tergites. Diameter of tubercle on 7th tergite (0.017–



Figs 11–15. *Xerobion desertorum* Kadyrbekov **sp.n.**, apterous viviparous female: 11 — habitus; 12 — III–VI antennal segments; 13 — ultimate rostral segment; 14 — siphunculus; 15 — cauda.

Рис. 11–15. *Xerobion desertorum* Kadyrbekov **sp.n.**, бескрылая живородящая самка: 11 — габитус; 12 — III–VI членики усиков; 13 — последний членик хоботка; 14 — трубочки; 15 — хвостик.

0.020) 0.77–1.0 of 1st one and 1.2–1.7 of basal diameter of 3rd antennal segment. Hairs on 3–6 tergites (0.034–0.039) 2.8–3.5 of basal diameter of 3rd antennal segment. 8th tergite with 4–7 hairs. Genital plate oval with 2 hairs on disc and 5–6 ones along its posterior margin. Legs normally developed. Trochanter hair of the hind leg (0.028–0.034) 0.65–0.80 and longest hair on the external side of hind femur (0.022–0.028) 0.50–0.65 of trochantro-femoral suture. First tarsal segments with 3:3:2 hairs.

Color on slide: head, 1st, 2nd, 6th, apices of 5th antennal segments, clypeus, 3rd –4th segments of rostrum, coxae, trochanters, femora (besides the bases), bases and apices of tibiae, tarsi, genital plate, dorsal spots on pro-, meso-, metathorax, siphunculi brown; cauda pale.

Natural coloration: body dark-green without wax powder; eyes dark-reddish; siphunculi blackish.

Measurements of holotype. Body 1.22; antennae 0.44–0.45: III 0.091, IV 0.052–0.065, V 0.078, VI 0.13–0.14 (0.08+0.05–0.06); siphunculi 0.039/0.065; cauda 0.065/0.117; ultimate rostral segment 0.117; second segment of hind tarsus 0.091.

HOST PLANT. *Helichrysum arenarium* (L.) Moench. (Asteraceae).

BIONOMY. Aphids suck on flowers and shoots, visited by ants.

Xerobion cinae (Nevsky, 1928)

= *X. artemisiae* (Narzikulov, 1949) **syn. n.**
= *X. terraealbae* (Ivanovskaja, 1959) **syn. n.**

REMARKS. We have studied type slides of *X. artemisiae* and *X. terraealbae* (Table 1). Values of morphological characters from Table 1 have almost complete overlap in fact. Thus, *X. artemisiae*, *X. terraealbae* living on the plants of *Seriphidium* subgenus from *Artemisia* genus are new synonyms of *X. cinae*. *X. hirsutum* (Nevsky, 1929) is described erroneously by the larvae of some older of *Protaphis* species. Alate viviparous females on the same slides aren't differs from alate viviparous females of *X. cinae*. Thus, *X. hirsutum* should be moved into the genus *Protaphis* Börner, 1952.

Apterous viviparous female (by specimens from type series and materials from Kazakhstan). Body oval, 1.22–1.82. Cuticle reticulated. Frons convex. Frontal setae (0.031–0.039) 1.6–2.3 of basal diameter of 3rd antennal segment. Antennae six-segmented, 0.31–0.46 of body length. Third segment 1.3–2.0 of 4th, 1.7–2.5(2.8) of processus terminalis and 0.7–1.0 of 6th segment. Processus terminalis 0.55–0.70 of base of 6th segment. Fourth segment 0.9–1.0 of 5th. Secondary rhinariae are on 3rd (0–5), 4th (0–2), 5th (0–1) antennal segments. Hairs on 3rd segment (0.008–0.014) 0.6–1.0 of its basal diameter. Clypeus normal, rostrum reaches behind to middle coxae. Ultimate rostral segment stiletto-shaped, 1.20–1.45 of second segment of hind tarsus, with 2 accessory hairs. Siphunculi very short, volcano-shaped with flanges, about 0.033–0.043 of body length, 0.50–0.85 of cauda length, 0.5–0.8 of its maximal width, 0.48–0.63 of second segment of the hind tarsus. Cauda triangular, 0.42–0.75 of its basal width, 0.6–1.1 of second segment of hind tarsus, with 14–22 hairs. Marginal tubercles gentle, hemispherical, developed on prothorax, 1st and 7th tergites. Diameter of tubercle on 7th tergite (0.039–0.050) 1.2–1.4 of 1st one and 2.0–2.5 of basal diameter of 3rd antennal segment. Hairs on 3–6 tergites (0.022–0.028) 1.3–1.7 of basal diameter of 3rd antennal segment. 8th tergite with 4–6 hairs. Genital plate oval with 2–3 hairs on disc and 5–9 ones along its posterior margin. Legs normally developed. Trochanter hair of the hind leg (0.034–0.039) 0.75–0.85 and longest hair on the external side of hind femur (0.022–0.028) 0.45–0.65 of trochantro-femoral suture. First tarsal segments with 3:3:2 hairs.

Color on slide: head, 1st, 2nd, 5th, 6th antennal segments, clypeus, 3rd –4th segments of rostrum, coxae, trochanters, femora, bases and apices of tibiae, tarsi, genital plate, dorsal spots and stripes on pro-, meso-, metathorax, 4–5th, 7–8th tergites brownish; siphunculi brown; cauda pale or light brownish.

Natural coloration: body dark-green or green-brownish with wax powder; eyes dark-reddish; siphunculi blackish.

Alate viviparous female (by 6 specimens). Body oval, 1.26–1.53. Antennae 0.51–0.56 of body length. Third antennal segment 1.75–2.0 of 4th, 1.05–1.35 of 6th, 2.6–3.7 of processus terminalis. Fourth antennal segment 0.9–1.1 of 5th. Secondary rhinariae are on 3rd (5–11), 4th (1–4), 5th (0–1) antennal segments. Siphunculi about 0.55–1.00 of cauda. Other characters as apterous female.

Color on slide: head, thorax, antennae, clypeus, 3rd –4th segments of rostrum, coxae, trochanters, femora, bases and apices of tibiae, tarsi, genital plate, dorsal spots and stripes on pro-, meso-, metanotum, marginal spots on 1–6th , stripes on 7–8th tergites, siphunculi brown; cauda light brownish.

Table 1. Comparison of some morphological characteristics of some familiar species from *Xerobion* genus.
Таблица 1. Сопоставление некоторых морфологических признаков обычных видов рода *Xerobion*.

Characters/Species	*X. cinae*	*X. artemisiae*	*X. terraealbae*
Third antennal segment/Fourth antennal segment	1.3–2.0	1.7–1.8	1.7
Third antennal segment/Sixth antennal segment	0.7–1.0	1.4	1.0–1.1
Third antennal segment/Processus terminalis	1.7–2.8	3.0–3.2	2.8
Processus terminalis/Base of Sixth antennal segment	0.5–0.7	0.7–0.8	0.7
Siphunculi/ Body length	0.033–0.043	0.027	0.033
Siphunculi/ Cauda	0.5–0.8	0.8	1.0–1.25
Ultimate rostral segment/Second segment of hind tarsus	1.20–1.45	1.23–1.25	1.25
Frontal hairs length/Basal diameter of third antennal segment	1.8–2.5	1.6–2.3	1.8–2.1
Quantity of hairs on cauda	14–22	10–18	13–18

HOST PLANT. *Artemisia* (*s.str.*) *annua* L., *A.* (*Seriphidium*) *compacta* Fisch. et DC., *A.* (*S.*) *cina* Berg., *A.* (*S.*) *gurganica* Krasch., *A.* (*S.*) *ferganensis* Krasch., *A.* (*S.*) *halophila* Krasch., *A.* (*S.*) *heptapotamica* Poljak., *A.* (*S.*) *lercheana* Web., *A.* (*S.*) *leucodes* Schrenk, *A.* (*S.*) *nitrosa* Web., *A.* (*S.*) *serotina* Bge., *A.* (*S.*) *scopiformis* Ledeb., *A.* (*S.*) *schrenkiana* Ledeb., *A.* (*S.*) *sublessingiana* (Kell.) Krasch., *A.* (*S.*) *terrae-albae* Krasch., *A.* (*S.*) *turanica* Krasch. (Asteraceae).

BIONOMY. Aphids suck on flowers and shoots, visited by ants.

Xerobion lambersi (Taschev, 1961) **stat.rest.**

= *X. tashevella* (Eastop et Hille Ris Lambers, 1976) **syn. n.**

REMARKS. This species has been reduced to synonyms of *X. cinae* [Eastop & Blackman, 2006]. However, it differs from *X. cinae* by light-green natural color, pale femora (on slides), ratios of ultimate rostral segment to the second segment of hind tarsus (1.00–1.18 in comparison 1.2–1.4), siphunculi to cauda length (0.7–1.0 versus 0.5–0.9), diameter of tubercle on 7th tergite to basal diameter of 3rd antennal segment (1.0–1.5 and 2.0–2.5), length of hairs on 3–6 tergites to basal diameter of 3rd antennal segment (1.6–2.0 against 1.3–1.7) and host plants from different subgenus of *Artemisia*. Materials from Iran (Alvaz, *Artemisia dracunculus*) [Barbagallo, 1996], Ukraine [Bozhko, 1976], Moldova [Vereshchagin et al., 1985], Pakistan [Naumann-Etienne & Remaudiere, 1995] should include to *X. lambersi* .

Apterous viviparous female (by 20 specimens from Bulgaria, Iran, Kazakhstan). Body oval, 1.29–1.69. Cuticle reticulated. Frons convex. Frontal setae (0.028–0.036) 1.6–2.2 of basal diameter of 3rd antennal segment. Antennae five- or six-segmented, 0.37–0.47 of body length. Third segment 1.3–2.0 of 4th, 1.9–2.6 of processus terminalis and 0.70–1.05 of 6th segment. Processus terminalis 0.56–0.80 of base of 6th segment. Fourth segment 0.90–1.05 of 5th. Secondary rhinariae are on 3rd ((0)1–7), 4th ((0)1–3), 5th (0–2) antennal segments. Hairs on 3rd segment (0.011–0.017) 0.7–1.0 of its basal diameter. Clypeus normal, rostrum reaches behind to middle coxae. Ultimate rostral segment stiletto-shaped, 1.00–1.18 of second segment of hind tarsus, with 2 accessory hairs. Siphunculi very short, volcano-shaped with flanges, about 0.033–0.048 of body length, 0.7–1.0 of cauda length, 0.55–0.70 of its maximal width, 0.45–0.55 of second segment of the hind tarsus. Cauda triangular, 0.40–0.55 of its basal width, 0.6–0.8 of second segment of hind tarsus, with 14–26 hairs. Marginal tubercles gentle, hemispherical, developed on prothorax, 1st and 7th tergites. Diameter of tubercle on 7th tergite approximately equal to that on 1st one and 1.0–1.5 of basal diameter of 3rd antennal segment. Hairs on 3–6 tergites (0.025–0.034) 1.6–2.0 of basal diameter of 3rd antennal segment. 8th tergite with (4) 5–6 (7) hairs. Genital plate oval with 2 hairs on disc and 6–8 ones along its posterior margin. Legs normally developed. Trochanter hair of the hind leg (0.028–0.034) 0.65–0.85 and longest hair on the external side of hind femur (0.022–0.025) 0.5–0.6 of trochantro-femoral suture. First tarsal segments with 3:3:2 hairs.

Color on slide: frons, apices 6th antennal segments, clypeus, 3rd–4th rostral segments, tarsi, genital plate light-brown; siphunculi brown; cauda pale.

Natural coloration: body light-green or green without wax powder; eyes dark-reddish; siphunculi light-brown.

Alate viviparous female (by 6 specimens). Body oval, 1.22–1.60. Antennae 0.39–0.49 of body length. Third antennal segment 1.8–2.2 of 4th. Fourth antennal segment 0.9–1.0 of 5th. Secondary rhinariae are on 3rd (5–12), 4th (2–5), 5th (1–3) antennal segments. Siphunculi about 0.034–0.039 of body length, 0.75–0.95 of cauda, 0.65–0.95 of its maximal width. Cauda 0.50–0.55 of its basal width . Other characters as apterous female.

Color on slide: head, thorax, 1st, 2nd, apices of 6th antennal segments, clypeus, 3rd–4th segments of rostrum, coxae, trochanters, apices of femora, tarsi, genital plate, some marginal dorsal spots on 1–4th tergites, siphunculi light brownish; cauda pale.

HOST PLANT. *Artemisia* (*Oligosporus*) *arenaria* DC., *A.* (*O.*) *dracunculus* L., *A.* (*O.*) *marschalliana* Spreng., *A.* (*O.*) *scoparia* Waldst. et Kit. (Asteraceae).

BIONOMY. Aphids suck on flowers and shoots, visited by ants.

Xerobion juchnevitchae Smajlova, 1974

REMARKS. *X. juchnevitchae* Smajl. is unique in this genus. Its ultimate rostral segment is shorter than the second segment of hind tarsus in comparison with other species.

MATERIAL EXAMINED**.** Paratypes: 11 apterous viviparous females, slide No 179 (old series), *Atriplex cana,* Central Kazakhstan, Karaganda Area, Zhanaarka district, Koksenghir mountains, Taldymanak river, 13.07.1962, N.E. Smajlova. 1 alate viviparous female, 4 apterous viviparous females, slide No 2585 (old series), *Atriplex cana,* Eastern Kazakhstan, Semipalatinsk Area, Madeniet small town environs, 31.05.1978, N.E. Smajlova.

Apterous viviparous female (by specimens from type series and other materials). Body oval, 1.17–1.79. Cuticle reticulated. Frons convex. Frontal setae (0.045–0.056) 2.0–3.0 of basal diameter of 3rd antennal segment. Antennae six-segmented, 0.51–0.73 of body length. Third segment (1.45) 1.6–2.0 of 4th, 2.8–3.7 of processus terminalis and 1.10–1.35 of 6th segment. Processus terminalis 0.50–0.65 of base of 6th segment. Fourth segment 0.86–1.15 of 5th. Secondary rhinariae are on 3rd (0–2) antennal segment only. Hairs on 3rd segment (0.022–0.034) 1.2–1.6 of its basal diameter. Clypeus normal, rostrum reaches behind to middle coxae. Ultimate rostral segment stumpy, pointed, 0.8–0.9 of second segment of hind tarsus, with 2 accessory hairs. Siphunculi very short, volcano-shaped with flanges, about 0.044–0.050 of body length, 0.57–0.72 of cauda length, 0.45–0.65of its maximal width, 0.40–0.55 of second segment of the hind tarsus. Cauda triangular, 0.40–0.55 of its basal width, 0.70–0.85 of second segment of hind tarsus, with 15–25 hairs. Marginal tubercles gentle, hemispherical, developed on prothorax, 1st and 7th tergites. Diameter of tubercle on 7th tergite (0.028–0.039) 0.8–0.9 of 1st one and 1.3–1.8 of basal diameter of 3rd antennal segment. Hairs on 3–6 tergites (0.030–0.050) 1.5–2.5 of basal diameter of the 3rd antennal segment. 8th tergite with 6–10 hairs. Genital plate oval with 2–4 hairs on disc and 8–14 ones along its posterior margin. Legs normally developed. Trochanter hair of the hind leg (0.045–0.050) 0.9–1.0 and longest hair on the external side of hind femur (0.039–0.045) 0.8–0.9 of trochantro-femoral suture. First tarsal segments with 3:3:2 hairs.

Color on slide: head, 1st, 2nd, 5th, 6th antennal segments (sometimes all antennae), clypeus, 3rd–4th segments of rostrum, coxae, trochanters, femora, bases and apices of tibiae, tarsi, genital plate, dorsal spots and stripes on pro-, meso-, metathorax, 7–8th abdominal tergites brownish; siphunculi brown; cauda pale or light brownish.

Natural coloration: body dark-green or brownish with wax powder; eyes dark-reddish; siphunculi blackish.

Alate viviparous female (by 1 specimen). Body oval, 1.81. Secondary rhinariae are only on 3rd (9) antennal segments. Ultimate rostral segment 0.75 of second segment of hind tarsus. Siphunculi about 0.035 of body length. Cauda 0.61 of its basal width, 0.46 of second segment of hind tarsus. Other characters as apterous female.

Color on slide: head, thorax, antennae, clypeus, 3rd –4th segments of rostrum, coxae, trochanters, femora, bases and apices of tibiae, tarsi, genital plate, dorsal spots and stripes on pro-, meso-, metathorax, marginal spots on 1–6th, stripes on 7–8th tergites, siphunculi brown; cauda light brownish.

HOST PLANT. *Atriplex cana* C.A. Mey. (Chenopodiaceae).

BIONOMY. Aphids suck on lower side of leafs, visited by ants.

ETYMOLOGY. This species is named after Lydia Juchnevitch. Therefore the correct species name to be *X. juchnevitchae*, but not *X. juchnevitchi*.

Xerobion caspicae (Bozhko, 1963)

= *X. brutii* (Barbagallo, 1996) **syn.n.**
= *X. georgii* (Mier et Nieto, 1991) **syn.n.**

I have examined a specimen of the paratype from collection of M.P. Bozhko. Some of the measurements and proportions: frontal and dorsal hairs (0.019) 0.7 of basal diameter of 3rd antennal segment, trochanter hair of the hind leg (0.019) 0.25 of trochantro-femoral suture, u. r. s. 0.17, 2 s. h. t. 0.15, siphunculi 0.063 of body length are added to the original description by me. Specimen from Kazakhstan on *Artemisia* sp. (collection of Institute of Zoology, Almaty) have same characteristics and 16 hairs on the cauda. Table 2 shows the comparative values for 9 main morphological traits in three species *Xerobion* with short frontal hairs, living on plants of the subgenus *Oligosporus* from genus *Artemisia*. We have almost complete overlap of the values of these morphological characters in fact. Thus, these characteristics leave no doubt that *X. brutii* (Barbagallo, 1996) and *X. georgii* (Mier et Nieto, 1991) are new synonyms of *X. caspicae* (Bozh.).

Key to apterous viviparous females of *Xerobion* Nevsky, 1928

1 Aphids with thick wax powder. Ultimate rostral segment elongated, more 1.5 of second segment of hind tarsus. 2
— Aphids with or without wax powder. Ultimate rostral segment elongated, stumpy or stiletto-shaped, no more 1.45 of second segment of hind tarsus. 6
2 Marginal tubercles on 1st and 7th abdominal tergites only. Secondary rhinariae on 3rd –5th antennal segments in norm. On *Helichrysum armoenium*. Iran. .... *X. album* (Remaudière et Davatchi, 1959)
— Marginal tubercles on 1st–4th, 7th abdominal tergites. Secondary rhinariae are absent. 3
3 Ultimate rostral segment 1.9–2.3 of second segment of hind tarsus. Processus terminalis 0.8–1.0 of base of 6th antennal segment. 8th tergite with 4 hairs. On *Kochia prostrata, K. scoparia*. Spain, Italy, Ukraine, Russia (North Caucasus, Lower Volga), Azerbaijan, Pakistan, Uzbekistan, Kazakhstan, West China (Xinjiang). .... *X. eriosomatinum* Nevsky, 1928
— Ultimate rostral segment no more 1.75 of second segment of hind tarsus. 8th tergite with 2–3 hairs. 4
4 3rd antennal segment 0.95–1.00 of 6th one and 2.2–2.6 of processus terminalis. Siphunculi 0.9–1.0 of cauda. Cauda with 8–10 hairs. On *Cichorium intybus*. Ukraine. .... *X. inthybi* Bozhko, 1963
— 3rd antennal segment 0.76–0.92 of 6th one and 1.6–2.0 of processus terminalis. Siphunculi 0.45–0.65 of cauda. Cauda with 12–18 hairs. 5
5 Processus terminalis 0.9–1.2 of base of 6th antennal segment. Siphunculi 0.45–0.55 of cauda. Cauda 0.8–1.0 of second segment of hind tarsus. On *Camphorosma* spp. Bulgaria, Kazakhstan, West China (Xinjiang). .... *X. camphorosmae* (Taschev, 1961)
— Processus terminalis 0.75–1.00 of base of 6th antennal segment. Siphunculi 0.60–0.65 of cauda. Cauda 1.0–1.1 of second segment of hind tarsus. On *Helichrysum arenarium*. Kazakhstan. ..... *X. barsukense* **sp. n**.
6 Ultimate rostral segment stumpy, 0.75–0.90 of second segment of hind tarsus. On *Atriplex cana*. Kazakhstan. ..... *X. juchnevitchae* Smajlova, 1974

Table 2. Comparison of some morphological characteristics of *Xerobion* species with short frontal hairs.
Таблица 2. Сравнение некоторых морфологических признаков видов рода Xerobion species с короткими лобными волосками.

Characters/Species	*X. caspicae*	*X. georgii*	*X. brutii*
Third antennal segment/Fourth antennal segment	1.3–1.5	1.5–1.8	1.3–1.5
Third antennal segment/Sixth antennal segment	0.7–1.0	0.6–1.0	0.6–1.0
Third antennal segment/Processus terminalis	2.6–3.2	2.6–3.3	1.7–2.1
Processus terminalis/Base of Sixth antennal segment	0.4–0.6	0.5–0.7	0.6–0.8
Siphunculi/ Body length	0.030–0.063	0.033–0.053	0.038–0.060
Siphunculi/ Cauda	0.7–0.9	0.6–0.8	0.7–1.0
Ultimate rostral segment/Second segment of hind tarsus	1.1–1.2	1.05–1.20	1.10–1.25
Frontal hairs length/Basal diameter of third antennal segment	0.7–0.9	0.7	0.7–1.1
Quantity of hairs on cauda	12–16	16–26	15–18

— Ultimate rostral segment elongated, stumpy or stiletto-shaped, equal or longer of the second segment of hind tarsus. No on Chenopodiaceae. 7
7 Marginal tubercles on 1st and 7th abdominal tergites only. 8
— Marginal tubercles on 1st-4th, 7th abdominal tergites. 15
8 Frontal hairs 0.7–1.0 of basal diameter of the 3rd antennal segment. On *Artemisia* (*Oligosporus*) *campestris, A.* (*O.*) *variabilis, A. caspica*. Spain, Italy, Ukraine, Kazakhstan. ..... *X. caspicae* (Bozhko, 1963)
— Frontal hairs no lesser 1.5 of basal diameter of the 3rd antennal segment. 9
9 Aphids light-green or green, with or without slight wax powder. Ultimate rostral segment stumpy, elongated or stiletto-shaped, 1.00–1.18 of second segment of hind tarsus. 10
— Ultimate rostral segment stiletto-shaped, 1.2–1.4 of second segment of hind tarsus. 13
10 Frontal hairs 1.5–2.0 of basal diameter of the 3rd antennal segment. 11
— Frontal hairs 2.0–3.5 of basal diameter of the 3rd antennal segment. 12
11 3rd antennal segment 0.6–0.7 of 6th one. Processus terminalis 0.95–1.10 of base of 6th antennal segment. On *Hyalea pulchella*. Turkmenistan, Southern Kazakhstan. ..... *X. zoijae* (Nevsky, 1937)
— 3rd antennal segment 0.7–1.0 of 6th one. Processus terminalis 0.56–0.80 of base of 6th antennal segment. On *Artemisia* (*Oligosporus*) *dracunculus, A.* (*O.*) *marschalliana, A.* (*O.*) *scoparia, A.* (*O.*) *tomentella*. Bulgaria, Moldova, Ukraine, Turkey, Iran, Pakistan, Afghanistan, Kazakhstan. ..... *X. lambersi* (Taschev, 1961)
12 3rd antennal segment 0.8–0.9 of 6th one and 2.2 of processus terminalis. Ultimate rostral segment stumpy, pointed. Siphunculi 0.050–0.056 of body length. Secondary rhinariae are absent. Cauda with 11–16 hairs. On *Artemisia desertorum*. Russia (Far East). .... *X. amurensis* (Pashtshenko, 1992)
— 3rd antennal segment 1.0–1.4 of 6th one and 2.9–3.9 of processus terminalis. Ultimate rostral segment stiletto-shaped. Siphunculi 0.040–0.044 of body length. Secondary rhinariae on 3rd –4th antennal segments. Cauda with 19–22 hairs. On *Cousinia perovskiensis, Cirsium arvense*. Kazakhstan. ..... *X. compositae* **sp. n.**
13 More large. Frontal hairs 1.5–2.5 of basal diameter of the 3rd antennal segment. Secondary rhinariae in norm on 3rd –4th antennal segments, rarely on 5th one. Cauda with 14–24 hairs. On *Artemisia* (*Seriphidium*) spp. Iran, India (Kashmir), Turkmenistan, Uzbekistan, Tajikistan, Kyrgyzstan, Kazakhstan, West China (Xinjiang), Russia (Lower Volga, West Siberia). ..... *X. cinae* (Nevsky, 1928)
— Very small. Frontal hairs 2.5–4.0 of basal diameter of the 3rd antennal segment. Secondary rhinariae rarely on 3rd –4th antennal segments. Cauda with 8–14(16) hairs. 14
14 Cauda triangular, 0.055–0.065 of body length. On *Artemisia* (*Seriphidium*) spp. Kazakhstan, West China (Xinjiang). ..... *X. alakuli* (Juchnevitsh, 1974)
— Cauda bluntly triangular, 0.045–0.053 of body length. On *Helichrysum arenarium*. Kazakhstan. .... *X. desertorum* **sp. n.**
15 Frontal hairs shorter, no more 1.2 of basal diameter of the 3rd antennal segment. 16
— Frontal hairs longer, no lesser 1.5 of basal diameter of the 3rd antennal segment. 17
16 Frontal hairs 1.0–1.2 of basal diameter of the 3rd antennal segment. 3rd antennal segment 2.0–3.0 of processus terminalis. Processus terminalis 0.45–0.55 of base of 6th antennal segment. Ultimate rostral segment 1.0–1.2 of second segment of hind tarsus. On *Artemisia* (*Seriphidium*) *maritima*. Hungary. ..... *X. hortobagyi* (Szelegiewicz, 1978)
— Frontal hairs 0.5–0.7 of basal diameter of the 3rd antennal segment. 3rd antennal segment 1.4–1.9 of processus terminalis. Processus terminalis 0.7–0.8 of base of 6th antennal segment. Ultimate rostral segment 1.25–1.40 of second segment of hind tarsus. On *Artemisia* (*s. str.*) *absinthium*. Hungary, Kazakhstan. .... *X. pannonica* (Szelegiewicz, 1978)
17 Frontal hairs 1.5–1.7 of basal diameter of the 3rd antennal segment. On *Artemisia* (*Oligosporus*) *campestris, A.* sp. Poland, Latvia, Kazakhstan (north). .... *X. judenkoi* (Szelegiewicz, 1959)
— Frontal hairs 2.5–4.5 of basal diameter of the 3rd antennal segment. On *Artemisia* (*Seriphidium*) *herba-alba*; Spain. ..... *X. blascoi* (Prieto et Segovia, 1998)

Conclusions

The revision of *Xerobion* Nevsky, 1928 is provided the first time. Three new species are described and three ones are re-described. Five species are recognized as the synonyms. Key to all known species of *Xerobion* by the apterous viviparous females is compiled.

ACKNOWLEDGEMENTS. I thanks to Georges Remaudière (Museum national d'Histoire naturelle, Paris, France) and Andrey Stekolshchikov (Zoological Institute RAN, Saint Petersburg, Russia) for the opportunity to examine type specimens of some species.

References

Barbagallo S. 1996. On a new *Absinthaphis* species living on *Artemisia variabilis* in Italy (Homoptera, Aphididae) // Bollettino di Zoologia Agraria e di Bachicoltura. Vol.28. No.2. P.99–109.

Blackman R.L., Eastop V.F. 2006. Aphids on the World's Herbaceous Plants and Shrubs. Vol.1–2. John Wiley & Sons Ltd. Natural History Museum. The Aphids. 1439 pp.

Bozhko M.P. 1963. [Xeromorphic aphids (Homoptera, Aphidoidea) of the steppe zone of Ukraine and considerations about their origin] // Trudy Biologicheskogo Faculteta Kharkovskogo Universiteta. T.36. P.108–143. [in Russian].

Bozhko M.P. 1976. [Aphids of the nutritious plants]. Kharkov: Visha shkola. 131 pp. [in Russian].

Eastop V.F. & Blackman R.L. 2005. Some new synonyms in Aphididae (Hemiptera: Sternorrhyncha) // Zootaxa. No.1089. P.1–36.

Garcia Prieto F., Sanchis Segovia A. 1998. *Aphis* (*Absinthaphis*) *blascoi* sp.n. living on *Artemisia herba-alba* in Los Monegros (Spain) // Aphids in natural and managed ecosystems. Leon. P.345–349.

Ivanovskaja O.I. 1960. [Xerobionts of Aphidina (Homoptera) subtribe of Soviet Union] // Trudy Biologicheskogo Instituta SO AN USSR, Vyp.6. P.87–154. [in Russian].

Juchnevitsh L.A. 1974. [New aphids species (Homoptera, Aphidinea) from Southern-Eastern Kazakhstan] // Trudy Instituta Zoologii AS Kaz. SSR. T.35. P.51–55. [in Russian].

Kadyrbekov R.Kh. 1995. [About status of two aphids species (Homoptera, Aphidinea) described by L.A. Juchnevitsh] // Selevinia. Vol.3. No.2. P.29–31. [in Russian].

Kadyrbekov R.Kh. 2001. Contribution to the systematic of the xerobiont supraspecific taxa from subtribe Aphidina (Homoptera, Aphididae) // Tethys Entomological Research. Vol.3. P.91–99.

Mier Durante M.P., Nieto Nafria J.M. 1991. *Aphis* (*Absinthaphis*) *georgii* n.sp. (Homoptera, Aphididae), a new aphid living on *Artemisia* (Compositae) in Spain // Entomologica Basiliensia. Vol.14. P.9–21.

Naumann-Etienne K., Remaudiere G. 1995. A comment preliminary checklist of aphids (Homoptera: Aphididae) of Pakistan and their host plants // Parasitica. Vol.51. No.1. P.3–61.

Nevsky V.P. 1929. [A plant-lice of the Middle Asia] // Trudy Uzbekskoy Opytnoy Stantsyi Zashchity Rasteniy. No.16. P.1–424. [in Russian].

Nevsky V.P. 1937. [To the knowledge of aphids from the Middle Asia] // Bulletin Sredneasiatskogo Gosudarstvennogo Universiteta. T.22. P.291–298. [in Russian].

Remaudière G., Davatchi A. 1959. Sur deux Aphididae (Hom.) nouveaux vivant en Iran sur *Helichrysum* et *Centaurea* // Revue de Pathologie vegetale et d'entomologie agricole de France. Vol.38**.** No.3. P.201–210.

Remaudière G., Remaudière M. 1997. Catalogue des Aphididae du monde. Paris: INRA. 473 pp.

Smajlova N.E. 1974. [New subspecies and species of aphids (Homoptera, Aphidoidea) from Central Kazakhstan] // Trudy Instituta Zoologii AN Kaz. SSR. T.35. P.43–50. [in Russian].

Szelegiewicz H. 1959. Zwei neue Blattlausarten (Hom. Aphididae) aus Polen // Annales Zoologici. Vol.18. No.1. P.1–10.

Szelegiewicz H. 1978. Three new aphid species (Hom., Aphidoidea) from *Artemisia* in Hungary // Acta Zoologica Academie Science Hungary. Vol.24. No.1–2. P.211–218.

Taschev D.G. 1961/1962. Zwei neue Blattlausarten der gattung *Brachyunguis* Das aus Bulgarien (Hom., Aphid.) // Annuaire de L'Universite de Sofia. Bd.56. S.191–203.

Vereshchagin B.V., Andreev A.V., Vereshchagina A.V. 1985. [Aphids of Moldavia]. Kishinev: Shtiinca. 157 pp. [in Russian]