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Review of *Solenoxyphus* Reuter, 1875 (Heteroptera: Miridae: Phylinae)

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ABSTRACT

Key, descriptions, data on distribution and host plants are given for all 16 known species of *Solenoxyphus* Reuter, 1875, including three new ones: *Solenoxyphus anabasius*, n. sp. (Kazakhstan), *S. salsolae*, n. sp. (Mongolia), and *S. kerzhneri*, n. sp. (Kazakhstan, Kyrgyzstan). The generic name *Solenoxyphus* Reuter, 1875 is synonymized with *Leucopterum* Reuter, 1879. The following new synonymies are established: *L. candidatum* (Reuter, 1879) = *L. longicolle* (Reuter, 1879), *S. lepidus* (Puton, 1874) = *S. minor* Wagner, 1969, and *S. alkani* Önder, 1975 = *S. markevichi* Putshkov, 1978. *S. adspersus* (Reuter, 1904) is removed from synonymy and considered a valid species.

INTRODUCTION

The name *Solenoxyphus* was published by Reuter in 1875 while genera *Malthacosoma* and *Leucopterum* were described by the same author four years later (Reuter, 1879). According to Reuter's descriptions, all these genera, especially *Malthacosoma* and *Leucopterum*, are closely related to each other but differ in the structure of the prosternal xyphus, width, and length of the head,

structure of the clypeus, length of labium, and length of third tarsal segment. Carapezza (1997) correctly pointed out that the degree of concavity in the prosternal xyphus, as well as the degree of development of the suture between the frons and clypeus is of limited systematic relevance. Therefore he synonymized *Malthacosoma* with *Solenoxyphus* based on almost identical color pattern, vestiture, pretarsal structure, and male genitalia. Thus the modern concept of *Solenoxyphus* compris-

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es eight species, excluding *Solenoxyphus saulei* (Ribes, 1976), which was synonymized with *Psallopsis femoralis* (Ribes et al., 2004).

Leucopteryx is a small host-specific phyline genus currently including seven species. The distribution is principally Irano-Turanian; four species are found in Mongolia and one is recorded from northwest China. The genus has not been revised and its relationships with other genera were not discussed since the original description (Reuter, 1879). Careful investigation of all species of *Leucopteryx* and *Solenoxyphus* allows me to conclude that they are congeneric. All the distinctive features of *Leucopteryx* indicated by Reuter, specifically the comparatively long labium, broad clypeus, prosternal xyphus with sharp margins, and shortened third tarsal segment, vary within both genera and cannot be viewed as diagnostic. *Solenoxyphus* and *Leucopteryx* share a common color pattern, similar pretarsal structure, and male genitalia. In both genera the vesica has a thin and more or less straight apical process, a weakly sclerotized step-shaped projection behind the secondary gonopore, and the secondary gonopore is bordered by a remarkable series of teeth. The peculiar structure of the vesica is unique for Palaearctic Phylini and is therefore considered diagnostic for the group. Based on the foregoing features the genus *Leucopteryx* Reuter, 1879 is synonymized with *Solenoxyphus* Reuter, 1875.

Examination of the extensive material housed in the collection of Zoological Institute, Russian Academy of Sciences, makes it possible to provide a key to species, as well as to clarify their distribution. In order to simplify determination, brief morphological descriptions with notes on distribution and host plants are given for each species. Exact identifications of females in some cases will require association with males. The key is designed for use with male specimens, although it will work for females of most species. Species treatments are presented in alphabetical order. The territories from which a species is recorded for the first time are marked with asterisks.

The term *dots* is used in the descriptions to denote small, usually round, variously colored spots, while *spots* is reserved to indicate small

but irregularly shaped colored areas. Unless otherwise stated, all scale bars are 0.05 mm. Specimen measurements are given for five specimens of each sex taken from across the distributional range in all cases where sufficient material was available.

Bar code labels, which uniquely identify each specimen, were attached to the specimens, and are referred to as unique specimen identifiers (USIs). Generally each USI label corresponds to a single specimen; however, some USI labels correspond to two or three specimens in cases in which several specimens are mounted on one pin. Because of the long period over which specimens were examined for this study, USI labels were not attached to some loaned specimens. As a way of accessing additional information, such as color photographs, specimens dissected, notes, collecting method, and specimens photographed for specimens examined in the Planetary Biodiversity Inventories Project on Plant Bugs and the present paper please refer to the www.discoverlife.org website. During the last century many toponyms in Russia and Middle Asian countries were renamed, sometimes several times. The borders between countries, provinces, and districts have also changed through time. Thus the exact data labels often became a source of long-standing confusion. The original locality data is given in square brackets if it differs from currently existing toponyms (see specimens examined).

Unless otherwise stated, all examined specimens including types of new species are retained in the Zoological Institute, St. Petersburg. Abbreviations of institutions and private collections for loaned material are given as follows:

AC	Collection of Prof. Attilio Carapezza, Palermo, Italy.
AMNH	American Museum of Natural History, New York, USA.
BMNH	Museum of Natural History, London, Great Britain.
JR	Collection of Dr. Jordi Ribes, Barcelona, Spain.
MNHN	Muséum National d'Histoire Naturelle, Paris, France.
UASK	Institute of Zoology, Ukrainian Academy of Sciences, Kiev, Ukraine.
ZMMU	Zoological Museum, Moscow Lomonosov State University, Russia.

Solenoxyphus Reuter, 1875

Solenoxyphus Reuter, 1875: 93. Type species by monotypy: *Macrocoleus lepidus* Puton, 1874.

Malthacosoma Reuter, 1879: 253–254 (syn. by Carapezza, 1997: 166). Type species by monotypy: *Malthacosoma punctipenne* Reuter, 1879.

Leucopteryx Reuter, 1879: 259, n. syn. Type species by subsequent designation (Kirkaldy, 1906: 126): *Leucopteryx fasciatum* Reuter, 1879 (= *Leucopteryx candidatum* Reuter, 1879).

DIAGNOSIS: Distinguished by the shape of the vesica with apex abruptly narrowed just beyond secondary gonopore, forming weakly sclerotized step-shaped projection; apical process thin and more or less straight, with slightly curved apex; area adjacent to secondary gonopore remarkably dentate. Tarsal apices and claws darkened.

Solenoxyphus spp. are most similar in color pattern, measurements, and vestiture to *Compsidolon* Reuter, 1899, *Compsionannus* Reuter, 1902, *Taeniophorus* Linnavuori, 1952, *Camptotyliidea* Wagner, 1957, and *Psallopsis* Reuter, 1901. Representatives of the last genus differ from *Solenoxyphus* in the maculate pattern of the membrane, small pulvilli, and structure of the vesica. *Compsionannus* differs from *Solenoxyphus* in the maculate second antennal segment, structure of the vesica, and characteristic mottling on the membrane, similar to that of *Psallopsis*. In contrast to *Solenoxyphus*, the dorsal surface in *Compsidolon* is covered with spots in addition to dots, and the secondary gonopore is located far from the apex of vesica. The dotting of the dorsal surface in *Solenoxyphus* somewhat resembles that of the monotypic genus *Taeniophorus* and some species of *Camptotyliidea*, e.g., *C. alba* (Reuter, 1879) and *C. albovitata* (Reuter, 1903). However, these taxa differ from *Solenoxyphus* in the remarkably long pulvilli, extending almost to the apex of the claw, the structure of the vesica, and association with various Fabaceae host plants.

DESCRIPTION: VESTITURE: Body with simple silver setae (fig. 52), dorsal surface in some species partly covered with pale brown setae. Setae straight or somewhat curved, usually adpressed but sometimes semierect. Genae under eyes and coxae laterally with contrastingly long and erect silver setae.

STRUCTURE: Elongate or elongate-oval, small bugs (1.7–5.0 mm). Males more or less parallel-sided, females smaller and more stumpy. Head (fig. 51) wider than high, declivent, weakly projecting beyond eyes. Clypeus prominent, but usually not visible in dorsal view. Antennae thin; length of second segment usually subequal to width of pronotum in males and subequal to width of head in females, sometimes segment much shorter. Labium of variable length, reaching from middle coxae to seventh abdominal segment, apically darkened. Pronotum transverse, usually 2.0–2.3 × as wide as long, with indistinct calli. Metathoracic scent-gland evaporatory area as in figs. 53, 54. Forewings usually well developed, only females of *S. anabasius* and *S. nanophyti* with shortened forewings.

MALE GENITALIA: Genital segment and parameres of typical structure. Right paramere (figs. 24, 35, 42) small, spoon-shaped, strongly flattened, with indistinct apical process. Left paramere (figs. 25, 36, 43) strongly excavated, with well-developed apical process and sensory lobe. Vesica S-shaped, with abrupt steplike narrowing at apex. Secondary gonopore with well-developed sculpture, remarkable series of teeth laterally in all species, except *S. anabasius* (figs. 40, 41), and dentate area proximally; number of denticles varying within a species. Apical process of vesica thin and pointed, rarely blunt and covered with minute spinules. Vesica usually with more or less developed longitudinal flange (figs. 22, 23) running from base toward secondary gonopore. Tarsi thin, second and third tarsal segments subequal in length (figs. 45–50). Claws slender, weakly curving apically (figs. 26–29). Pulvillus relatively small, reaching half the length of claw.

COLORATION: Background body color naturally greenish; yellowish, greenish or whitish, rarely (*S. asanovae*) in part embrowned in dry specimens. Head and antennae entirely pale, only in *S. asanovae* first antennal segment and ventral side of head darkened. Pronotum and scutellum uniformly pale, rarely covered with brown to pale brown dotting. Thorax pale, rarely partly embrowned, brown in the darkest specimens of *S. asanovae*. Color pattern of forewings usually composed of more or less regular pale brown to brown dotting. In *S.*

candidatus, this dotting absent, forewings with transverse pale brown band at apex of corium. Membrane rarely whitish, milky hyaline, usually more or less embrowned, often with pale brown wedge-shaped lateral spot behind apex of cuneus. Femora usually pale, rarely partly embrowned, often covered with dots. Tibiae pale, with minute dark dots at bases of spines. Tibial spines pale or slightly embrowned.

HOST PLANTS: Species of the genus inhabit deserts and semideserts. Nearly all representatives are specialized feeders of Chenopodiaceae. Only *S. alkani* was collected from *Cousinia* sp. (Asteraceae). *Artemisia* sp. (Asteraceae) was reported as host plant for *S. artemisiae*, *S. candidates*, and *S. lepidus*, although plants of the family Chenopodiaceae are known as hosts for all three species. It seems likely, therefore, that specimens found on *Artemisia* were accidentally collected.

KEY TO SPECIES

1. Smaller. Body length 1.7–2.2 mm. Females brachypterous (fig. 76), with forewings just surpassing sixth abdominal segment, membrane almost completely reduced, without clearly delimited cuneus. Vesica without series of teeth lateral to secondary gonopore (figs. 40, 41). On *Anabasis salsa*.
 *S. anabasius*, n. sp.
- Larger. Body length 2.8–5.0 mm. Females macropterous, if subbrachypterous forewings always surpassing eighth abdominal segment, with clearly delimited membrane and cuneus. Vesica with series of teeth lateral to secondary gonopore (figs. 1–18). 2
2. Forewings with transverse pale brown band at apex of corium (figs. 66, 67). In the palest specimens transverse band almost completely absent, but apex of corium always with contrastingly dark and long setae.
 *S. candidatus* (Reuter)
- Forewings with pale brown dotting. Apex of corium without contrasting dark setae or whole of forewings covered with darkened setae. 3
3. Hind femora pale, with dark brown dotting. Dots on hind femora contrasting darker and 2–3 × larger than those on forewings. In cases of doubt dots on basal part of cuneus absent or discolored. 4
- Hind femora pale or darkened; dots on hind femora, if present, similar in size and color to those on forewings. In cases of doubt dotting on basal part of cuneus well developed. . . . 6
4. Labium slightly surpassing middle coxae. In males, eyes large, vertex 1.1–1.2 × as wide as eye. Whole cuneus covered with minute and regularly distributed pale brown dots. Length more than 3.8 mm. *S. alkani* Önder
- Labium always surpassing hind coxae. In males, eyes smaller, vertex 1.4–1.6 × as wide as eye. Length less than 3.8 mm. 5
5. Apical process of vesica long, thin and acute, with somewhat curved apex, distinctly longer than width of vesica basal to secondary gonopore (figs. 13–15). Basal part of cuneus usually with reduced dotting (figs. 62, 65).
 *S. lepidus* (Puton)
- Apical process of vesica comparatively robust and shortened, straight, nearly as long as width of vesica basal to secondary gonopore (fig. 16). Whole cuneus covered with minute pale brown dots (fig. 57).
 *S. artemisiae* Putshkov
6. Forewings with thin darkened setae in addition to silver ones. 7
- Dorsum only with silver setae. 10
7. Pronotum and scutellum covered with dots (in the palest specimens recognizable only at apex of scutellum). Hind femora usually darkened. On *Nanophyton erinaceum*. . . . 8
- Pronotum and scutellum without any color pattern. Femora pale, with indistinct pale brown dotting. 9
8. Labium slightly surpassing hind coxae. In males, vesica with acute apical process (fig. 2); second antennal segment 1.2–1.4 × as long as width of head. Females subbrachypterous, membrane extending slightly beyond apex of cuneus.
 *S. nanophyti* (Vinokurov)
- Labium reaching seventh abdominal segment. In males, vesica with denticles at very apex (figs. 3–4); second antennal segment shorter than or equal to width of head. Females macropterous . . . *S. asanovae* (Vinokurov)
9. Larger. Body length 4.8–5.0 mm in males and 4.0–4.3 mm in females. Vesica with well developed series of teeth running to base of apical process (figs. 6, 7).
 *S. halocnemi* (Putshkov)
- Smaller. Body length 3.6–4.6 mm in males and 3.2–3.8 mm in females. Vesica with series of teeth not extending distal to secondary gonopore (figs. 32, 33). *S. pallens* (Reuter)
10. Membrane with reticulate pattern (fig. 64) or with wholly embrowned cells and brown edging along outer vein (fig. 63). Apical

- process of vesica (figs. 8, 9) comparatively robust and shortened, straight, nearly as long as width of vesica basal to secondary gonopore. *S. fuscovenosus* (Fieber)
- Membrane milky hyaline or more or less embrowned apically. Cells transparent or partly embrowned, but without brown edging. Apical process of vesica distinctly longer than width of vesica proximal to secondary gonopore. 11
 - 11. Area along inner claval margins, exocorium (except very apex) and base of cuneus devoid of any dots, or covered with few minute and pale ones (fig. 61). Labium reaching seventh abdominal segment. Vesica as in fig. 5, with well-developed series of teeth extending proximally and distally to secondary gonopore. Base of apical process covered with minute denticles.
. *S. loginovae* (Putshkov)
 - Whole forewings except membrane more or less regularly covered with dots, rarely dotting becomes obsolete at base of wing. Labium surpassing hind coxae, rarely reaching fourth abdominal segment. Vesica without minute denticles at base of apical process. 12
 - 12. Apical process of vesica shorter, pointed, without any teeth. 13
 - Apical process of vesica long and not pointed, apically covered with minute teeth (figs. 37–39). On *Salsola passerina*. . . *S. salsolae*, n. sp.
 - 13. Tibial spines embrowned. Whole cuneus covered with dots. 14
 - Tibial spines pale. Extreme base of cuneus with reduced dotting. 15
 - 14. Clavus corium and cuneus densely and regularly covered with extremely minute dots (fig. 73). These dots 3–4 × smaller in diameter than width of second antennal segment at base. . . *S. punctipennis* (Reuter)
 - Forewings with large and irregularly distributed dots (fig. 55). Largest dots on forewings equal in diameter to width of second antennal segment at base.
. *S. adspersus* (Reuter)
 - 15. Vesica with remarkably prominent longitudinal flange forming gutterlike depression, with poorly developed series of teeth not extending proximal to secondary gonopore (figs. 22, 23, 31). Scutellum usually with brown dotting apically. On *Suaeda* sp. Spain.
. *S. major* Wagner
 - Longitudinal flange remarkably narrow and weakly sclerotized. Series of teeth extending proximally to secondary gonopore (figs. 20, 21, 30). Scutellum uniformly pale. On *Salsola gemmascens*. Kazakhstan and Kyrgyzstan.
. *S. kerzhneri*, n. sp.

Solenoxyphus adspersus (Reuter, 1904)

Figures 10, 11, 27, 55

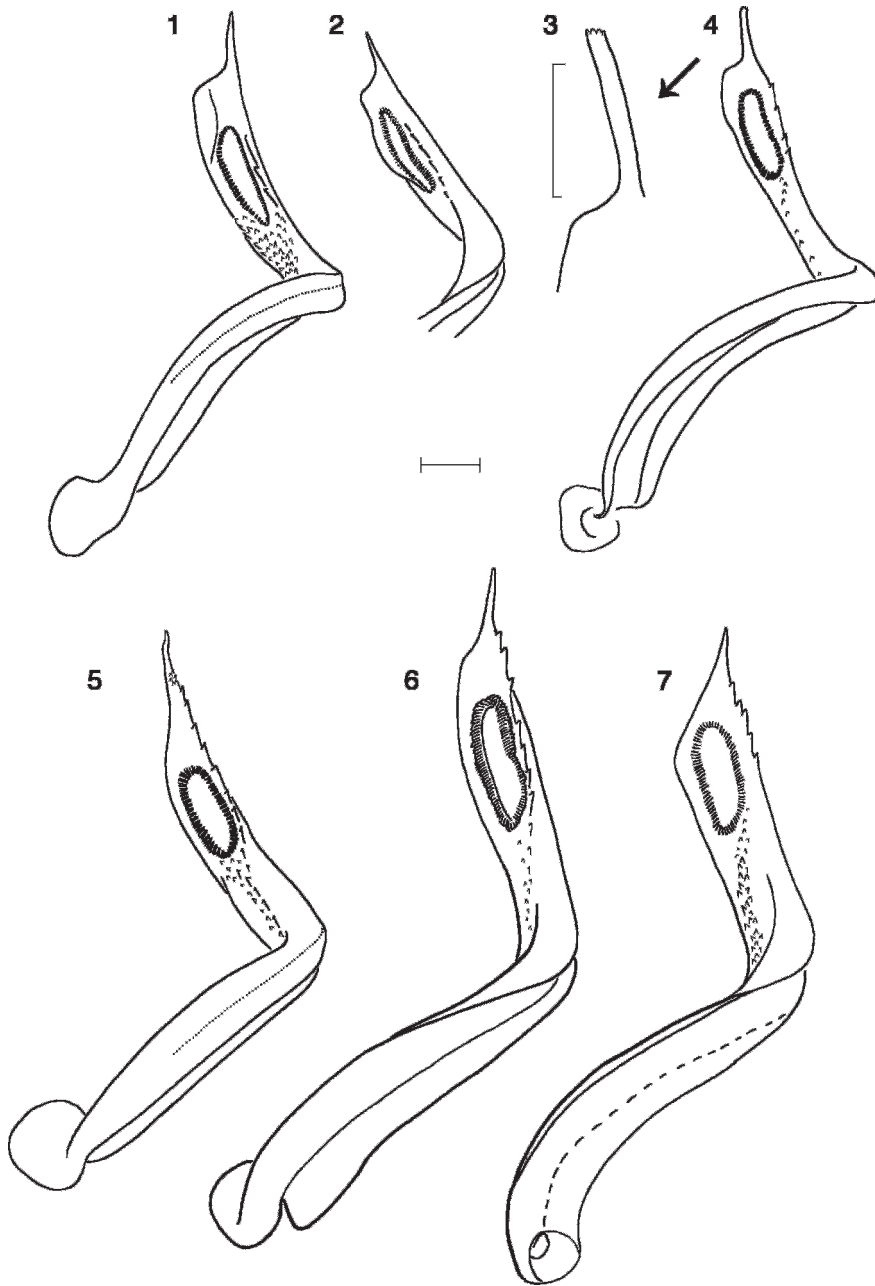
Malthacosoma adspersum Reuter, 1904: 11 (syn. with *M. punctipennis* by Linnavuori, 1961: 13).
Solenoxyphus barbatus Wagner, 1951: 147 (syn. with *Malthacosoma punctipenne* by Wagner, 1958: 8).

DIAGNOSIS: Distinguished by the comparatively large and irregularly distributed dots on forewings, faint dotting on hind femora, absence of dark setae on dorsum, dentation and structure of the apical process of vesica. Close to *S. loginovae*, but differs in the embrowned tibial spines, shorter labium and structure of vesica. Differs from *S. punctipennis* in the color pattern of forewings.

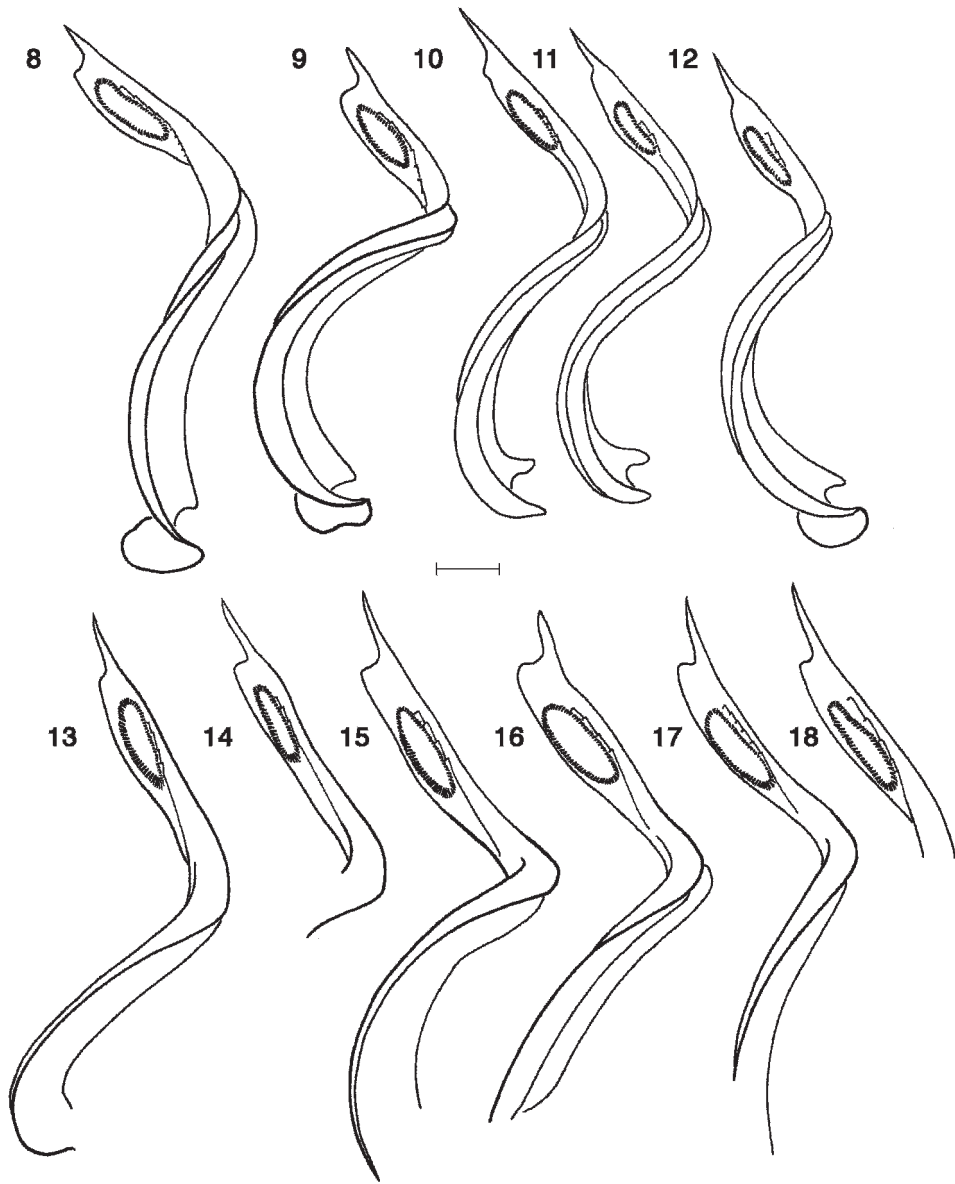
DESCRIPTION: VESTITURE: Composed of slightly curved to nearly straight silver simple setae, adpressed on forewings and often semierect on head and at sides of pronotum.

COLORATION: Body (fig. 55) whitish yellow to greenish. Head, antennae, pronotum, exposed part of mesoscutum and scutellum uniformly pale, without any color pattern. Scutellum sometimes with indistinct pale midline. Whole forewings except membrane covered with rather large and notably irregularly distributed pale brown dots. Dotting becomes obsolete at extreme base and sometimes also at sides of wing. Dots on corium nearly equal in diameter to width of second antennal segment at base. Cuneus with somewhat smaller and usually more regularly distributed dots. Membrane transparent, typically with indistinct pale brown area running along vein of larger cell and pale brown area behind apex of cuneus. Veins whitish or yellowish. Ventral surface pale. All femora typically with pale brown mottling on whole ventral surfaces except extreme bases. Dorsal surfaces of femora with identical mottling apically. Dots on femora of the same size or smaller and paler than those on forewings. Color pattern on femora more or less reduced in many specimens, sometimes lost. Tibia pale, with brown tibial spines. Minute brown dots at bases of tibial spines usually noticeable, rarely absent.

MALE GENITALIA: Vesica as in figs. 10–11, comparatively thin. Apical process long, thin and acute, with somewhat curved apex, dis-



Figs. 1–7. Vesica, ventral view: 1, *Solenoxyphus candidatus* (Kazakhstan: Karasay st.); 2, *S. nanophyti* (Tuva, paratype); 3–4, *S. asanovae* (Kazakhstan: Koksengir, paratype); 5, *S. loginovae* (Turkmenistan: Repetek, paratype); 6–7, *S. halocnemi*: 6, Kyrgyzstan, on *Anabasis truncata*, 7, Turkmenistan, Mollakara, paratype, on *Halocnemum strobilaceum*.



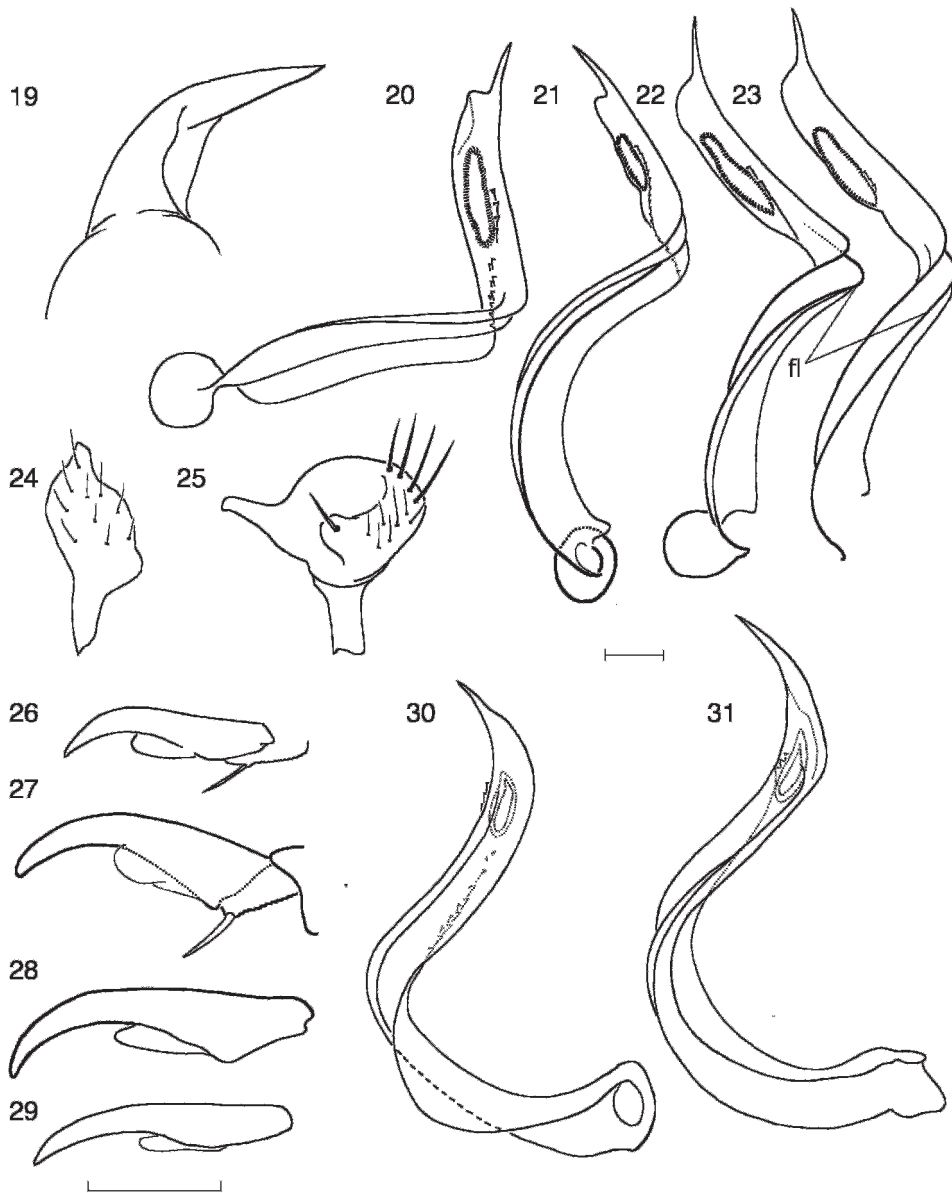
Figs. 8–18. Vesica, ventral view: **8–9**, *Solenoxyphus fuscovenosus*: **8**, Kazakhstan: Saykhin, on *Halocnemum strobilaceum*; **9**, Ukraine: Kerch. **10–11**, *S. adspersus*: **10**, Turkmenistan: Repetek (Hohlbeck); **11**, Uzbekistan: Derbent. **12**, *S. punctipennis*, Azerbaijan: Turut steppe. **13–15**, *S. lepidus*: **13**, Kazakhstan: Muyunkum sands; **14**, Mongolia: Gobi Altai Aimak; **15**, Spain: Alfés. **16**, *S. artemisiae*, Uzbekistan, holotype. **17–18**, *S. alkani*: **17**, Armenia, holotype of *S. markevichii*; **18**, Turkey, paratype.

tinctly longer than width of vesica proximal to secondary gonopore. Longitudinal flange distinct but narrow. Series of teeth not extending proximal or distal to secondary gonopore.

STRUCTURE AND MEASUREMENTS: Labium always surpassing hind coxae and usually reach-

ing third or fourth abdominal segment. Hind femora not swollen in both sexes, remarkably long and thin in males. Females macropterous.

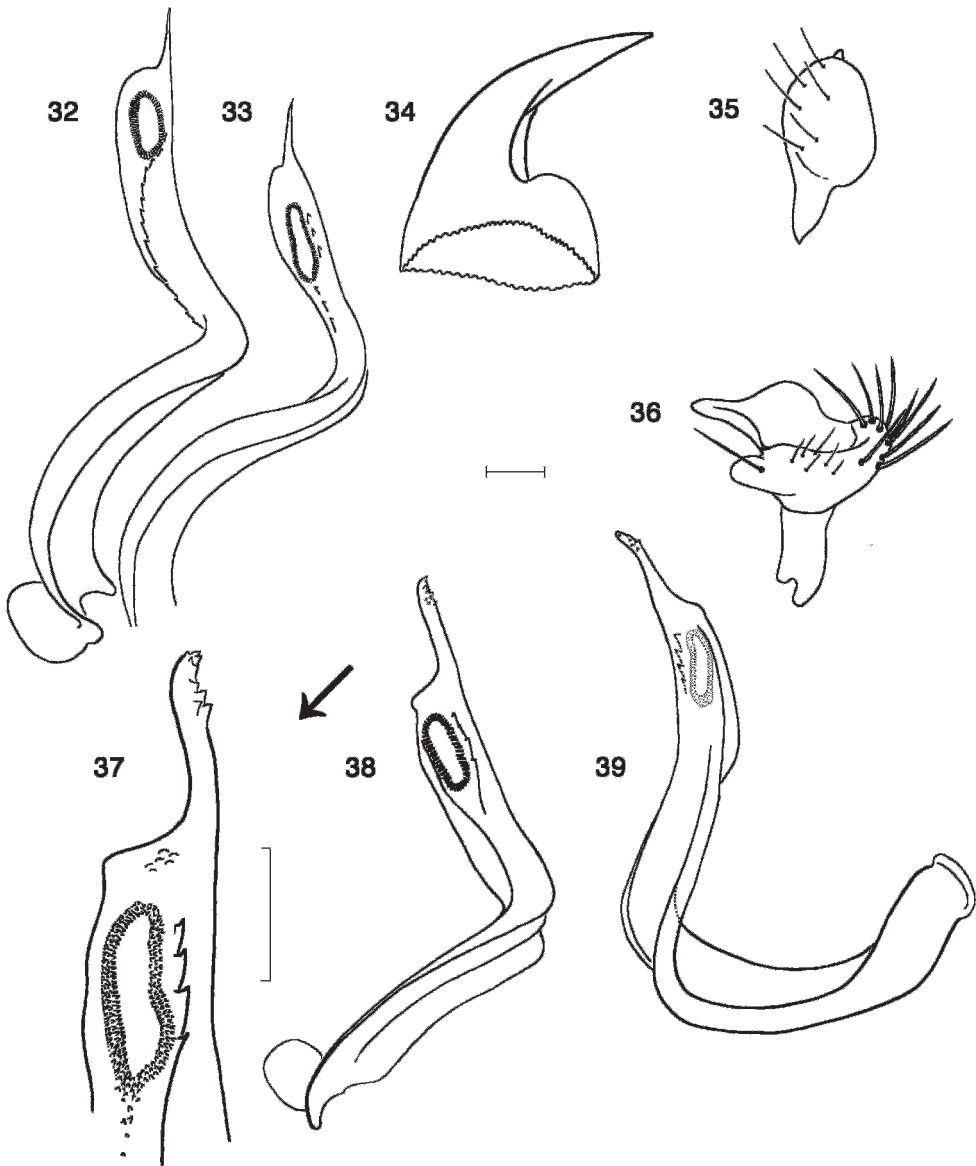
In males, body $3.4\text{--}3.8 \times$ as long as width of pronotum. Pronotum $1.9\text{--}2.1 \times$ as wide as long, $1.4\text{--}1.5 \times$ as wide as head. Vertex 1.3--



Figs. 19–31. 19–21, 24–25, 30, *Solenoxyphus kerzhneri*, Kyrgyzstan, paratype: 19, apex of theca; 20–21, vesica in ventral view; 24, right paramere; 25, left paramere; 30, vesica in side view. 22, 23, 31: *S. major*, vesica: 22, 31, Spain, Bujalaroz, collected from *Suaeda* sp.: 22, in ventral view; 31, in side view; 23, Spain: Alfés, in ventral view. 26–29, claws: 26, *S. kerzhneri*; 27, *S. adpersus*; 28, *S. salsolae*; 29, *S. anabasius*.

1.4 × as wide as eye. Second antennal segment 0.8–0.9 × as long as basal width of pronotum, 1.2–1.3 × as long as width of head. Body length: 3.6–4.2 mm.

In females body 3.1–3.3 × as long as width of pronotum. Pronotum 2.1–2.2 × as wide as long, 1.2–1.4 × as wide as head. Vertex 1.5–1.7 × as wide as eye. Second antennal segment

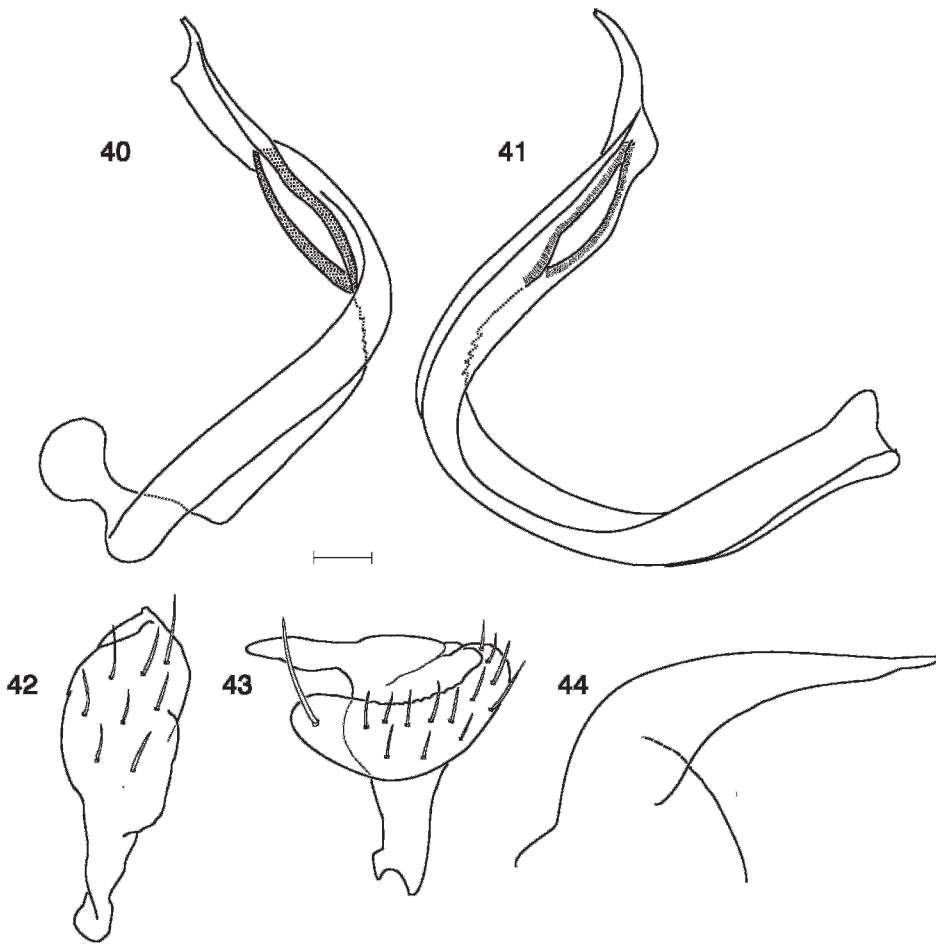


Figs. 32–39. 32–33, *Solenoxyphus pallens*, vesica in ventral view: 32, Kazakhstan: Zhana-Arka, on *Anabasis salsa*; 33, Mongolia: Hovd Aimak, on *Anabasis aphylla*. 34–39, *S. salsolae*, Mongolia, paratype, same locality label as in holotype: 34, apex of theca; 35, right paramere; 36, left paramere; 37–39, vesica: 37, apex, 38, ventral view, 39, side view.

0.7–0.8 × as long as basal width of pronotum, 0.9–1.0 × as long as width of head. Body length: 3.1–3.7 mm.

NOTE: *S. adspersus* was synonymized with *S. punctipennis* by Linnavuori (1961). Both species have similar vesical structure, general appearance, but noticeably differ in the color

pattern of forewings. In contrast to *S. punctipennis*, *S. adspersus* has distinctly larger and irregularly distributed dots on forewings. The color pattern appears nearly invariable across the range of *S. adspersus*, which make this species easily distinguishable from *S. punctipennis*. Although I have not studied the

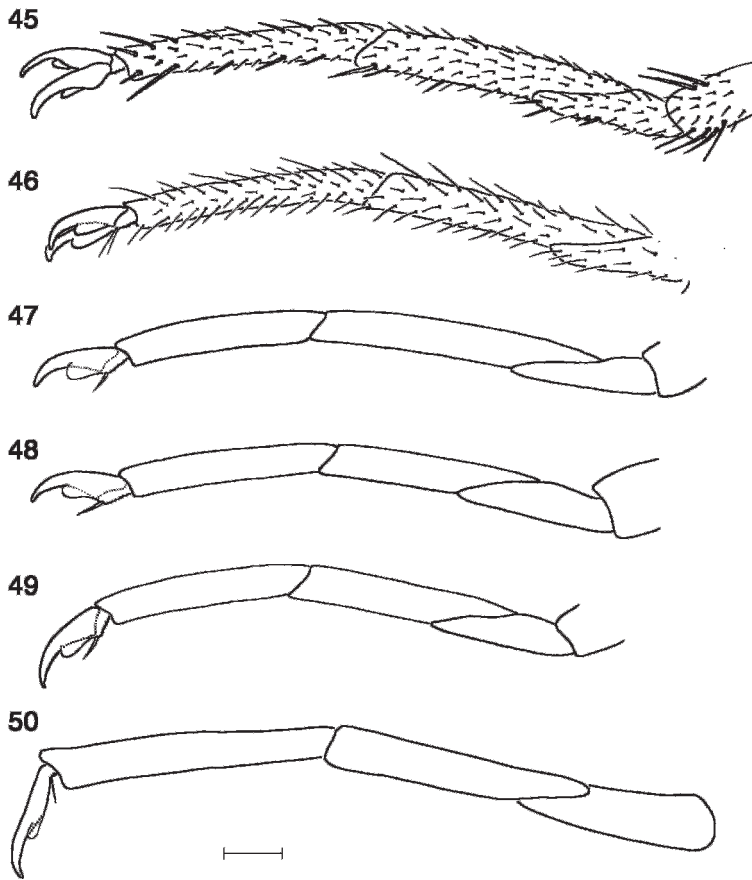


Figs. 40–44. Male genitalia in *S. anabasius*: 40, vesica in ventral view; 41, vesica in lateral view; 42, right paramere; 43, left paramere; 44, theca.

lectotype of *S. adspersus*, the collection of the Zoological Institute, St. Petersburg, contains three specimens from Ashgabat collected by Ahnger and determined by Reuter. One of these, the data for which are listed below under Specimens Examined, was labelled as *Malthacosoma adspersum*. Two other specimens have determination labels “*Malthacosoma punctipenne* Reut.” This material, as well as the type of *S. punctipennis*, was found to be in a full accordance with the original descriptions and species concepts accepted in this paper.

Judging by the original description, *S. barbatus* seems to be a junior synonym of *S. adspersus*, but this needs further clarification, as I was unable to see the types.

DISTRIBUTION: The distribution of *S. adspersus* in the Mediterranean region needs further clarification. *S. punctipennis* was recorded from Egypt (as *S. barbatus* Wagner, 1951), Tunisia (Carapezza, 1997), Iraq (Linnavuori, 1993), Israel (Linnavuori, 1961), and Afganistan (Hoberlandt, 1961). The first locality should be referred to *S. adspersus*, as *S. barbatus* is considered here its junior synonym. Examined specimens from Tunisia collected by Carapezza undoubtedly belong to *S. adspersus* too. Linnavuori (1961) has seen only the lectotype of *S. adspersus* while synonymizing the species with *S. punctipennis*. The type of *S. punctipennis* was not examined by him. Therefore, it seems likely that records of *S. punctipennis* from Iraq and Israel also



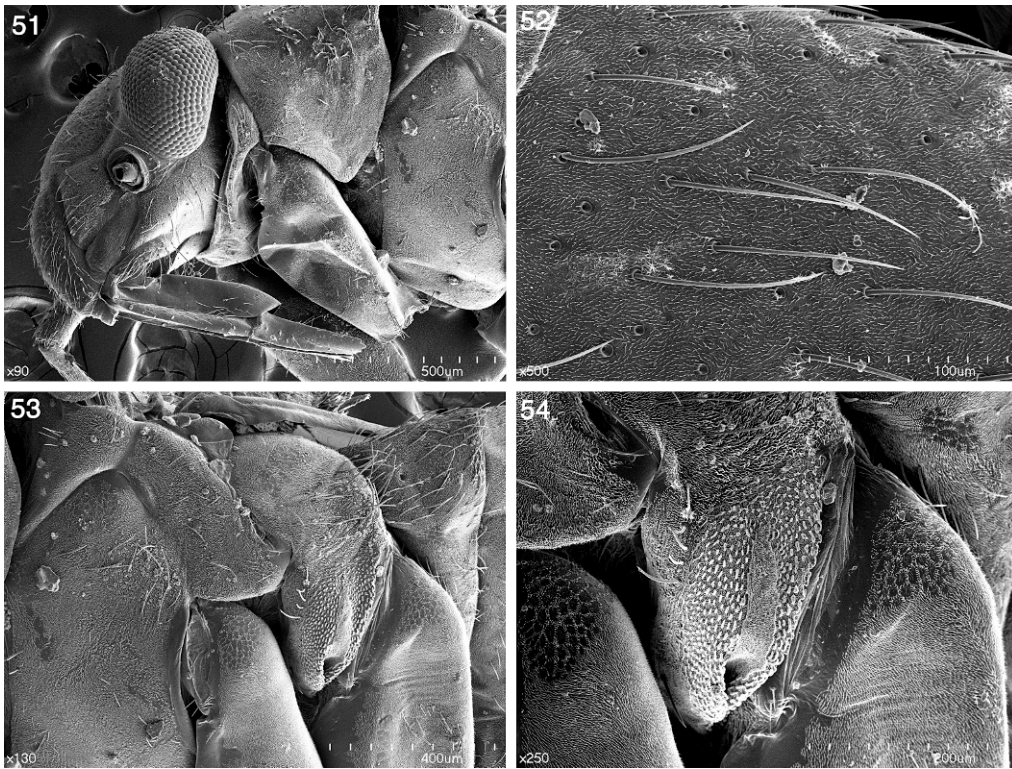
Figs. 45–50. Tarsi: **45**, *S. salsolae*; **46**, *S. kerzhneri*; **47**, *S. punctipennis*; **48**, *S. fuscovenosus*; **49**, *S. lepidus*; **50**, *S. anabasius*.

should be attributed to *S. adspersus*. However, both species are highly sympatric in the Caucasus and Central Asia. In the collection of the Zoological Institute, Russian Academy of Sciences, there are specimens of *S. adspersus* from Azerbaijan, Dagestan, southern Kazakhstan, southern and eastern Uzbekistan, Tajikistan, southern Turkmenistan, and Iran.

HOST PLANT: Kaplin (1993) indicated that *Suaeda arcuata* (Chenopodiaceae) was the host plant of a *Malthacosoma* sp. in the Repetek Nature Reserve (Turkmenistan). This reference most probably can be attributed to *S. adspersus*, as *S. punctipennis* is unknown from the well-sampled area of this reserve. One specimen of *S. adspersus* from Turkmenistan is labeled as collected from *Salsola* sp. (Chenopodiaceae). Linnavuori (1993) indicated that *Halocharis sulphurea*

(Chenopodiaceae) was the host plant for *M. punctipenne* from Iraq. Putshkov and Putshkov (1983) noted that in Azerbaijan and Armenia *M. punctipenne* feeds on *Suaeda* sp., while in Turkmenistan representatives of this species were also collected from *Kochia iranica*, *Climacoptera brachiata*, *C. korschinskyi* (Chenopodiaceae), and, occasionally, from *Atriplex turcomanica* (Chenopodiaceae). Hence, host-plant associations of *S. adspersus* and *S. punctipennis* need further verification.

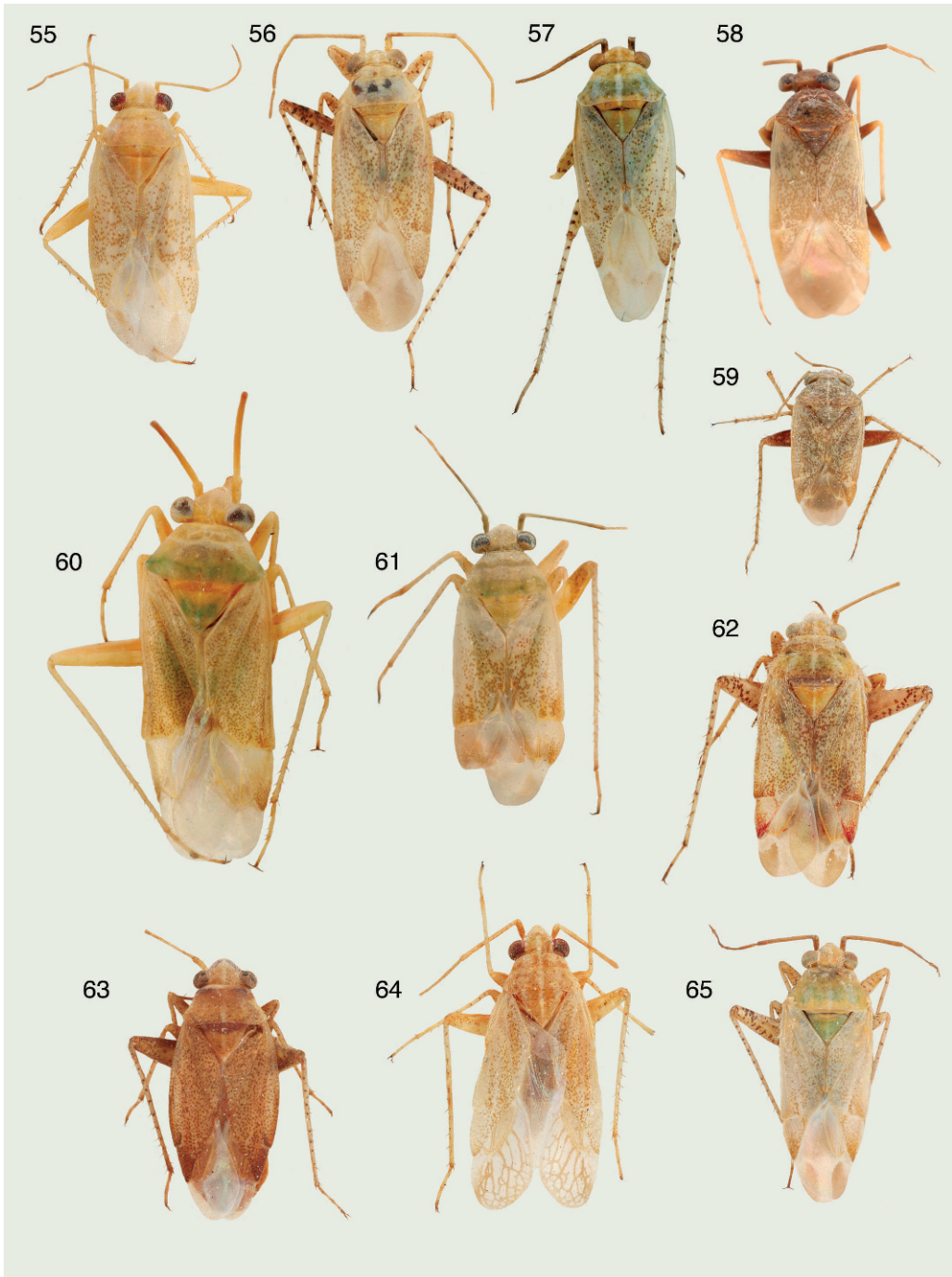
SPECIMENS EXAMINED: **ARMENIA:** Vedi nr Khosrov, 16 Jul 2002, M. Kalashian, 1 ♂ (AMNH_PBI 00141087) (AC). **AZERBAIJAN:** **Nakhichevan Prov.:** Hehram [Negram] on Araks River, 19 May 1934, Ryabov, 1 ♂ (AMNH_PBI 00141086). **IRAN:** **Semnan:** Emamshachr [Shachrud], 28 May 1914, A. N. Kiritshenko, 2 ♂ (AMNH_PBI 00140902, AMNH_PBI



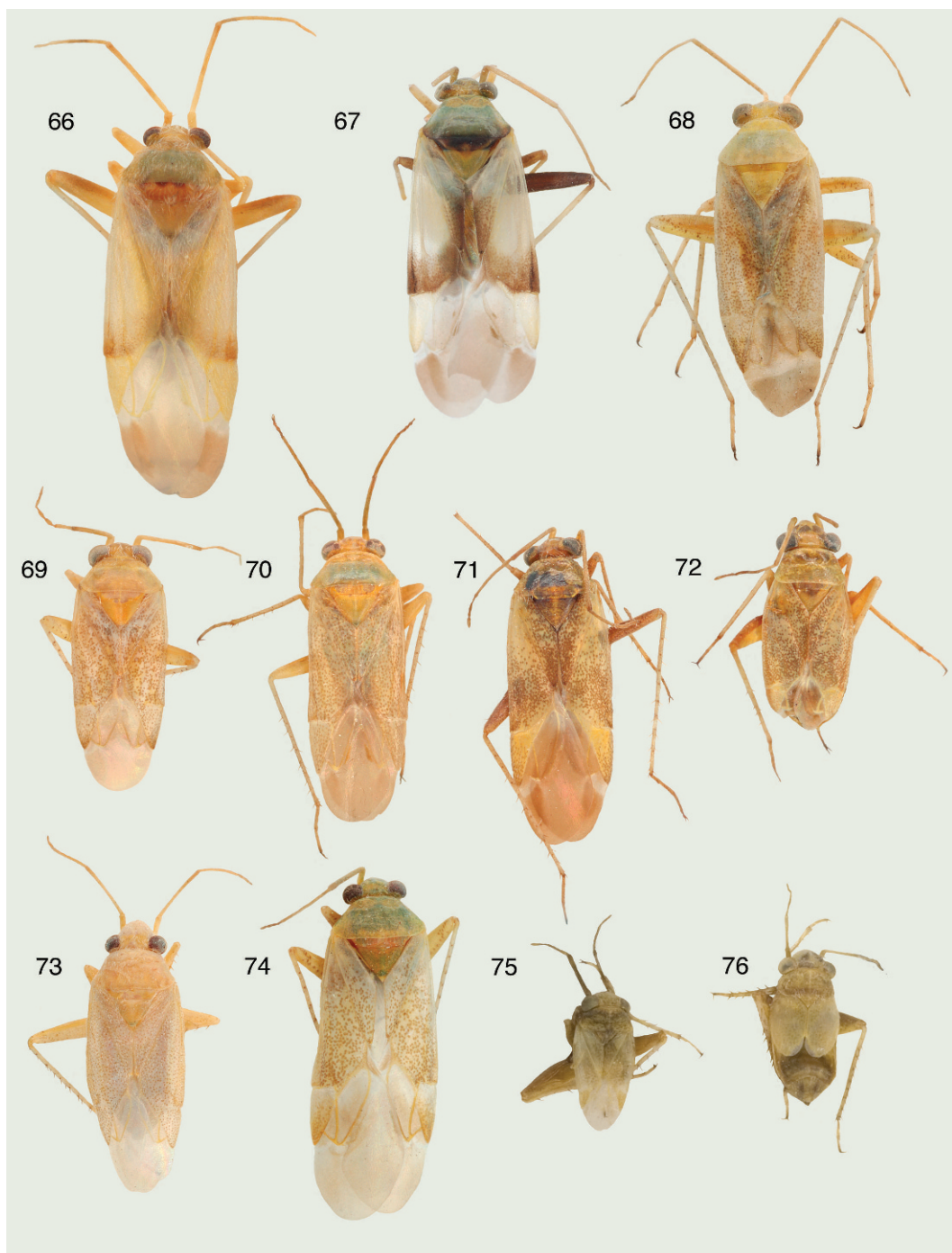
Figs. 51–54. *S. fuscovenosus*, female, scanning micrographs of morphological details: **51**, lateral view of head; **52**, setae on forewings; **53**, mesothoracic spiracle and metathoracic scent-efferent system; **54**, close-up of evaporatorium of metathoracic gland.

00140948), 3♀ (AMNH_PBI 00140914, AMNH_PBI 00140944, AMNH_PBI 00140946); 29 May 1914, A. N. Kiritshenko, 15♂ (AMNH_PBI 00140893, AMNH_PBI 00140903–AMNH_PBI 00140905, AMNH_PBI 00140907, AMNH_PBI 00140922–AMNH_PBI 00140927, AMNH_PBI 00140929, AMNH_PBI 00140931, AMNH_PBI 00140933, AMNH_PBI 00140947), 22♀ (AMNH_PBI 00140909–AMNH_PBI 00140913, AMNH_PBI 00140915–AMNH_PBI 00140920, AMNH_PBI 00140935–AMNH_PBI 00140936, AMNH_PBI 00140938–AMNH_PBI 00140939, AMNH_PBI 00140941–AMNH_PBI 00140942, AMNH_PBI 00140960–AMNH_PBI 00140964); 30 May 1914, A. N. Kiritshenko, 3♂ (AMNH_PBI 00140901, AMNH_PBI 00140921, AMNH_PBI 00140930), 4♀ (AMNH_PBI 00140934, AMNH_PBI 00140937, AMNH_PBI 00140940, AMNH_PBI 00140965); 05 Jun 1914, A. N. Kiritshenko, 1♂ (AMNH_PBI 00140894), 1♀ (AMNH_PBI

00140908); 06 Jun 1914, A. N. Kiritshenko, 3♂ (AMNH_PBI 00140906, AMNH_PBI 00140928, AMNH_PBI 00140932), 2♀ (AMNH_PBI 00140943, AMNH_PBI 00140945). **KAZAKHSTAN: South Kazakhstan Prov.:** Kyrk-kuduk, W of Saryagach, 13 Jun 1926–16 Jun 1926, Prinada, 3♂ (AMNH_PBI 00141137–AMNH_PBI 00141139), 3♀ (AMNH_PBI 00141125–AMNH_PBI 00141127). **Zhambul Prov.:** Merke nr Taraz [former Aulie-Ata], 16 Jun 1910, A. N. Kiritshenko, 5♀ (AMNH_PBI 00141036, AMNH_PBI 00141048–AMNH_PBI 00141050, AMNH_PBI 00141063). **RUSSIAN FEDERATION: Dagestan Rep.:** Derbent, 12 Jun 1928, Ryabov, 2♂ (AMNH_PBI 00141078, AMNH_PBI 00141079). **TAJIKISTAN:** Chubek, 25 Jun 1910, Zarudny, 1♂ (AMNH_PBI 00141080). Dushanbe [former Stalinabad], 17 Jul 1945, Gussakovskiy, 2♂ (AMNH_PBI 00140949, AMNH_PBI 00140950), 6♀ (AMNH_PBI 00140966–AMNH_PBI



Figs. 55–65. Dorsal habitus photographs: 55, *Solenoxyphus adspersus* ♂. 56, *S. alkani* (holotype of *S. markevichi*) ♂. 57, *S. artemisiae* ♂. 58, *S. asanovae* ♂. 59, *S. asanovae* ♀. 60, *S. halocnemi* ♂. 61, *S. loginovae* ♀. 62, 65, *S. lepidus* ♂. 63, *S. fuscovenosus* ♀. 64, *S. fuscovenosus* ♂.



Figs. 66–76. Habitus views: **66, 67**, *Solenoxyphus candidatus* ♂. **68**, *S. major* ♂. **69**, *S. salsolae* ♂. **70**, *S. pallens* ♂. **71**, *S. nanophyti* ♂. **72**, *S. nanophyti* ♀. **73**, *S. punctipennis* ♀. **74**, *S. kerzhneri* ♂. **75**, *S. anabasius* ♂. **76**, *S. anabasius* ♀.

- 00140971); 22 Jul 1945, Gussakovskiy, 4♂ (AMNH_PBI 00140951–AMNH_PBI 00140954), 1♀ (AMNH_PBI 00140972); 29 Jun 1945, Gussakovskiy, 1♂ (AMNH_PBI 00140955), 3♀ (AMNH_PBI 00140973–AMNH_PBI 00140975); 27 Jul 1945, Gussakovskiy, 1♀ (AMNH_PBI 00140956); 15 Jul 1945, Gussakovskiy, 1♀ (AMNH_PBI 00140957); 04 Jul 1945, Gussakovskiy, 1♀ (AMNH_PBI 00140958); 11 Jul 1945, Gussakovskiy, 2♂ (AMNH_PBI 00140976, AMNH_PBI 00140977), 5♀ (AMNH_PBI 00140986–AMNH_PBI 00140990); 09 Jul 1945, Gussakovskiy, 5♂ (AMNH_PBI 00140978–AMNH_PBI 00140982), 3♀ (AMNH_PBI 00140991–AMNH_PBI 00140993); 07 Jun 1934, Gussakovskiy, 1♂ (AMNH_PBI 00141099). Dushanbe [former Stalinabad], Islands in Dushanbe River, 08 Aug 1935, Gussakovskiy, 1♂ (AMNH_PBI 00141098); 04 Aug 1935, Gussakovskiy, 1♂ (AMNH_PBI 00141100), 1♀ (AMNH_PBI 00141101). DzhiliKul' on Vakhsh River, 02 Sep 1935, Gussakovskiy, 1♂ (AMNH_PBI 00141102). Dzhilikul' [Dzheli-kul'] nr Tartki [former Kabadian], 16 Jun 1910–21 Jun 1910, Zarudny, 2♂ (AMNH_PBI 00141094, AMNH_PBI 00141095), 2♀ (AMNH_PBI 00141064, AMNH_PBI 00141065). Kafirnigan River, nr Dushanbe [former Stalinabad], 08 Jul 1945, Gussakovskiy, 1♂ (AMNH_PBI 00141076). Kondara Canyon, valley of Varzob River, 31 Aug 1945, Gussakovskiy, 1♂ (AMNH_PBI 00141075); 08 Sep 1947, A. N. Kiritshenko, 1♀ (AMNH_PBI 00141104). Koy-Pyaz-Tau Mts nr Tartki [former Kabadian], 25 Jun 1934, Gussakovskiy, 1♂ (AMNH_PBI 00141103). Nr Kulyab, 23 Jul 1933, V. Popov, 7♂ (AMNH_PBI 00140956, AMNH_PBI 00140983–AMNH_PBI 00140985, AMNH_PBI 00141106–AMNH_PBI 00141108), 5♀ (AMNH_PBI 00140994–AMNH_PBI 00140998); 19 Jul 1933, V. Popov, 1♀ (AMNH_PBI 00141068). Parkhar on Pyandzh River, 17 Jul 1934, Luppova, 1♂ (AMNH_PBI 00141070). Ruidasht, 40 km from Dushanbe [former Stalinabad], 3000 m, 17 Jun 1938, Gussakovskiy, 1♀ (AMNH_PBI 00141071). Tartki [former Kabadian], 09 Jun 1934, Gussakovskiy, 1♀ (AMNH_PBI 00141066); 01 Jul 1934, Gussakovskiy, 1♂ (AMNH_PBI 00141067); 19 Jun 1934, Gussakovskiy, 1♀ (AMNH_PBI 00141115). Uzun, 30 km S Qurghonteppe [Kurgan-Tyube], 09 Jun 1936, Gussakovskiy, 1♂ (AMNH_PBI 00141105). Delta of Yavan-Su River nr Kuibyshevsk, 25 Jul 1943, A. N. Kiritshenko, 1♂ (AMNH_PBI 00141074), 1♀ (AMNH_PBI 00141073). **TUNISIA:** Gafsa, Oued Magroun, 18 Jun 1990, A. Carapezza, 1♂, 1♀, without USI label (AC). **TURKMENISTAN:** 50 km NW Tejen [Tedzhen], 28 Aug 1962, Guliev, 1♀ (AMNH_PBI 00141082). Akhchaguyma, 04 Jul 1934, V. Popov, 1♀ (AMNH_PBI 00141135). Ashgabat [Ashkhabad], 19 May 1932–23 May 1932, Ushinskiy, 2♂ (AMNH_PBI 00141133, AMNH_PBI 00141134); 04 Jun 1903, Ahnger, 1♀ (AMNH_PBI 00141128). Charjew [Chardzhui], 10 May 1889, Semenov, 1♀ (AMNH_PBI 00141084). Garrygala [Kara-kala], Syumy, 01 Jun 1931, Petrishcheva, 1♀ (AMNH_PBI 00141136). Gokdepe [Geok-tepe], 12 Jun 1928, Semenov, 2♂ (AMNH_PBI 00141120, AMNH_PBI 00141121), 1♀ (AMNH_PBI 00141119). Imambaba, Mary [Merv], 27 Apr 1912, Kozhanchikov, 2♂ (AMNH_PBI 00141122, AMNH_PBI 00141129), 1♀ (AMNH_PBI 00141124); 09 May 1912–11 May 1912, Kozhanchikov, 4♂ (AMNH_PBI 00141123, AMNH_PBI 00141130–AMNH_PBI 00141132). Morgunovskiy, 7 km N Kushka, 05 May 1964, Loginova, *Salsola* sp., 1♂ (AMNH_PBI 00141081). Nova [Nouo], Kopetdag Mts, 26 Sep 1930, Bianchi, 1♂ (AMNH_PBI 00141141). Repetek, 02 Jun 1962, Gornostaev and Vishnevskiy, 2♂ (AMNH_PBI 00141117, AMNH_PBI 00141118); 02 Jun 1962, Tryapitsin, 1♀ (AMNH_PBI 00141114). **UZBEKISTAN: Fergana Valley:** Massy nr Andijon [Andizhan], 01 Sep 1928, V. Kuznetsov, 1♀ (AMNH_PBI 00141083). Nr Namangan, Mingbulak [Min-Bulak] on Syr-Darya River, 22 May 1908, A. Kiritshenko coll., 1♀ (AMNH_PBI 00141090); 23 May 1908, A. Kiritshenko coll., 1♀ (AMNH_PBI 00141091). 12 km S of Gazli, 01 Jun 1948, A. N. Kiritshenko, 1♀ (AMNH_PBI 00141116). Derbent, 05 Jun 1912, A. N. Kiritshenko, 7♂ (AMNH_PBI 00141092–AMNH_PBI 00141093, AMNH_PBI 00141109–AMNH_PBI 00141113). Kanimekh NE of Bukhara, 18 Jul 1928, Burachek, 3♀ (AMNH_PBI 00141072, AMNH_PBI 00141096–AMNH_PBI 00141097);

21 Jul 1928, Burachek, 1♀ (AMNH_PBI 00141069). Kumak nr Samarkand, 07 Jul 1929, L. Zimin, 1♀ (AMNH_PBI 00141085). Kuylyuk, 21 Jul 1905, V. Oshanin coll., 1♂ (AMNH_PBI 00141037). Kyzylkum Sands, 20 km N of Ayakguzhumdy, 26 Apr 1965, I. M. Kerzhner, *Salsola* sp., 1♂ (AMNH_PBI 00141030), 4♀ (AMNH_PBI 00141031–AMNH_PBI 00141034). Kyzylkum Sands, Maschi Well, NW Nurata, 21 Jun 1928, Burachek, 1♂ (AMNH_PBI 00141077). Lyaylyakan nr Sherabad, 24 May 1910, Zarudny, 4♂ (AMNH_PBI 00141008–AMNH_PBI 00141011), 3♀ (AMNH_PBI 00141026–AMNH_PBI 00141028); 24 May 1910, Zarudny, 1♀ (AMNH_PBI 00141029). Nr Guzar, 09 Aug 1929, Elizarova, 1♀ (AMNH_PBI 00141023). Termez [Bukhara mer. = former Bukhara Chanate], 21 May 1912, A. N. Kiritshenko, 1♂ (AMNH_PBI 00141024); 19 May 1912, A. N. Kiritshenko, 1♂ (AMNH_PBI 00141025); 27 Jun 1912, A. N. Kiritshenko, 1♂ (AMNH_PBI 00141035); 23 May 1910–30 May 1910, Zarudny, 1♀ (AMNH_PBI 00141140). Toshkent [Tashkent], 07 May 1912, Seslavina, 8♂ (AMNH_PBI 00141038–AMNH_PBI 00141045), 10♀ (AMNH_PBI 00141051–AMNH_PBI 00141060); 09 Jun 1913, A. N. Kiritshenko, 2♂ (AMNH_PBI 00141046, AMNH_PBI 00141047), 2♀ (AMNH_PBI 00141061, AMNH_PBI 00141062). Yargak nr Khatyrchi, 16 Jun 1928, L. Zimin, 1♂ (AMNH_PBI 00141012); 05 Aug 1928–06 Aug 1928, L. Zimin, 1♂ (AMNH_PBI 00141013), 2♀ (AMNH_PBI 00140999, AMNH_PBI 00141106); 11 Jun 1928, L. Zimin, 7♂ (AMNH_PBI 00141014–AMNH_PBI 00141020), 6♀ (AMNH_PBI 00141000–AMNH_PBI 00141005); 16 Jun 1928, L. Zimin, 1♂ (AMNH_PBI 00141021); 12 Aug 1928, L. Zimin, 1♂ (AMNH_PBI 00141022).

Solenoxyphus alkani Önder, 1975

Figures 17, 18, 56

Solenoxyphus alkani Önder, 1975: 118–119.

Solenoxyphus markevichi Putshkov, 1978: 469–470, n. syn.

DIAGNOSIS: Recognized by the large dimensions, contrastingly dark and large dots

on hind femora and short labium. Similar to *S. lepidus* and *S. artemisiae* in coloration of hind femora, but can be distinguished by the length of labium, measurements, ocular index, and structure of the apical process of vesica.

DESCRIPTION: **VESTITURE:** Composed of long silvery setae, adpressed on forewings, semierect on head and at sides of pronotum.

COLORATION: Body (fig. 56) pale greenish. Head and antennae pale. First antennal segment with two minute subapical pale brown dots on medial surface. Pronotum and scutellum uniformly pale. Clavus and corium uniformly covered with rather dense and irregularly distributed pale brown dotting. Only at extreme base of wing dots becoming somewhat obsolete. Whole cuneus covered with minute and regularly distributed pale brown dots. The largest dots on forewings equal in diameter to width of second antennal segment at base or slightly smaller. Membrane with indistinctly embrowned areas around outer vein, indistinct embrowned area adjacent to apex of cuneus and pale brown wedge-shaped lateral spot separated from apex of cuneus by transparent rectangular stripe. Cells at least partly embrowned. Ventral surfaces of femora and apical parts of their dorsal surfaces covered with large, contrastingly dark brown dots. Ventral surface pale. Hind femora with dark dots 2–4 × as large as those on forewings, partly merging into transverse stripes on ventral surface and forming a series of dark round spots along foremargin. Tibia with large dark brown dots at bases of slightly embrowned tibial spines.

MALE GENITALIA: Vesica as in figs. 17, 18. Apical process long, thin, and acute, with somewhat curved apex, distinctly longer than width of vesica proximal to secondary gonopore. Longitudinal flange almost absent. Series of teeth not extending proximal or distal to secondary gonopore.

STRUCTURE AND MEASUREMENTS: Labium short, surpassing middle coxae and hardly reaching bases of hind coxae. Hind femora comparatively thin. Females macropterous.

In males, body 3.4 × as long as width of pronotum. Pronotum 1.8–1.9 × as wide as long, 1.4–1.5 × as wide as head. Vertex 1.1–1.2 × as wide as eye. Second antennal segment 0.8–0.9 × as long as basal width of pronotum,

1.2–1.3 × as long as width of head. Body length: 4.6–4.8 mm, 3.8 mm in holotype of *S. markevichi*.

In female (according to measurements by Önder, 1975) body 3.2 × as long as width of pronotum. Pronotum 2.1 × as wide as long, 1.5 × as wide as head. Vertex 1.8 × as wide as eye. Second antennal segment 0.9 × as long as basal width of pronotum, 1.4 × as long as width of head. Body length: 4.6 mm.

NOTE: While describing *S. markevichi*, Putshkov (1978) was obviously unaware of the description of *S. alkani* by Önder (1975). It is stated in the original description of *S. markevichi* that three specimens were collected at once, but two of them were subsequently lost, so the species is known only from the holotype. *Solenoxyphus alkani* was described from a single series of five males and one female. Examination of material shows that both species are almost identical in color pattern, structure of the male genitalia, and ratios, although the holotype of *S. markevichi* is smaller. *Solenoxyphus alkani* and *S. markevichi* were described from Turkey and Armenia correspondingly. The type localities of these species are located within distance of about 40 kilometers. I am therefore treating *S. markevichi* Putshkov, 1978 as a junior synonym of *S. alkani* Önder, 1975.

DISTRIBUTION: Turkey, Armenia.

HOST PLANT: *Solenoxyphus markevichi* was collected from *Cousinia* sp. (Asteraceae) (Putshkov, 1978).

SPECIMENS EXAMINED: Holotype of *S. markevichi*: ARMENIA: Vedi, 13 Jun 1977, Putshkov, 1 ♂ (AMNH_PBI00140865) (UASK).

Paratypes of *S. alkani*: TURKEY: Kars, S.E. Slopes of Ararat, 2400 m, 31 Aug 1960, Guichard & Harvey, 2 ♂, without USI label (BMNH).

Solenoxyphus anabasius, n. sp.

Figures 29, 40–44, 50, 75, 76

DIAGNOSIS: The species unequivocally recognized by the small size of both sexes, e.g., body length, shortened second antennal segment, head of equal width with pronotum at base, brachypterous females, and absence of series of teeth lateral to secondary gonopore.

Reminiscent of *S. asanovae* and *S. nanophyti* in brown dotting on pronotum and scutellum, but can be easily distinguished from both species by virtually all measurements, structure of the vesica, and degree of reduction of the forewings in females.

DESCRIPTION: VESTITURE: Whole of body covered only with silver simple setae.

COLORATION: Body (figs. 75, 76) pale yellow with greenish markings, naturally greenish. Head with brown dots on vertex, antennae uniformly pale. Pronotum and scutellum with dense minute brown dotting and narrow pale whitish midline. In males forewings usually whitish at base and sometimes along costal margin, with pale brown, degraded dots along claval commissure, on medioapical area of corium and on cuneus. These dots larger and paler than dots on pronotum, sometimes clearly recognizable only on cuneus. In females forewings with dense and sometimes confluent brown dots along inner margins; lateral parts and extreme bases of forewings uniformly pale or with a few indistinct pale brown dots. Fore- and middle femora uniformly pale, rarely with indistinct pale brown dots on ventral surfaces. Entire ventral surface and apices of dorsal surface of hind femora with a few pale brown dots or uniformly pale. Tibiae uniformly pale, with black tibial spines. Apical part of third tarsal segment and claws somewhat darkened.

MALE GENITALIA: Theca and parameres as in figs. 42–44. Vesica as in figs. 40–41. Apical process of vesica short, somewhat curved, apically serrate. Longitudinal flange absent. Vesica without a series of teeth lateral to secondary gonopore, but with a row of minute denticles proximally.

STRUCTURE AND MEASUREMENTS: Body stumpy. Head strongly declivent, labium always reaching and usually more or less surpassing hind coxae in males, frequently reaching base of ovipositor in females. Scutellum reduced, 1.1 × as wide as vertex in males, 0.8–0.9 × as wide as vertex in females, mesoscutum always covered with pronotum. Forewings in males normally developed but barely reaching apex of genital segment; in females reduced, just surpassing sixth abdominal segment, broadly rounded apically, with indistinctly delimited minute transverse cuneus and membrane. Hind fem-

ora distinctly swollen. Tarsi thin, as in fig. 50, claws as in fig. 29.

In males, body $2.3\text{--}2.5 \times$ as long as width of pronotum. Pronotum $2.2\text{--}2.4 \times$ as wide as long, $1.0\text{--}1.1 \times$ as wide as head. Vertex $1.2\text{--}1.4 \times$ as wide as eye. Second antennal segment $0.7\text{--}0.8 \times$ as long as basal width of pronotum, $0.7\text{--}0.9 \times$ as long as width of head. Body length: $1.7\text{--}2.0$ mm.

In females, body $2.5\text{--}2.7 \times$ as long as width of pronotum. Pronotum $2.1\text{--}2.4 \times$ as wide as long, $1.0 \times$ as wide as head. Vertex $1.3\text{--}1.6 \times$ as wide as eye. Second antennal segment $0.6\text{--}0.7 \times$ as long as basal width of pronotum, $0.6\text{--}0.7 \times$ as long as width of head. Body length: $2.1\text{--}2.2$ mm.

DISTRIBUTION: Known only from Karaganda Province of Kazakhstan.

HOST PLANT: *Anabasis salsa* (Chenopodiaceae).

ETYMOLOGY: The name *anabasius* refers to the host plant of the species.

SPECIMENS EXAMINED: Holotype: **KAZAKHSTAN: Karaganda Prov.:** Sarysu River 50 km NE mouth of Karakengir River, 24 May 1962, I. M. Kerzhner, *Anabasis salsa*, ♂ (AMNH_PBI 00142455).

Paratypes: **KAZAKHSTAN: Karaganda Prov.:** same label as holotype, 6♂ (AMNH_PBI 00142456–AMNH_PBI 00142459, AMNH_PBI 00142461–AMNH_PBI 00142462), 14♀ (AMNH_PBI 00142442–AMNH_PBI 00142452), 2 larvae (AMNH_PBI 00142453–AMNH_PBI 00142454). 40 km S of Atasu [Zhana-Arka], 21 Jun 1960, I. M. Kerzhner, *Anabasis salsa*, 1♀ (AMNH_PBI 00142463); 22 Jun 1960, I. M. Kerzhner, *Anabasis salsa*, 2♀ (AMNH_PBI 00142464, AMNH_PBI 00142465); 09 Jun 1960, I. M. Kerzhner, *Anabasis salsa*, 3♀ (AMNH_PBI 00142460, AMNH_PBI 00142466–AMNH_PBI 00142467). Nr Kense, 28 May 1976, I. M. Kerzhner, sweeping on *Anabasis salsa* and *Nanophyton* sp., 1♂ (AMNH_PBI 00142451), 3♀ (AMNH_PBI 00142468).

Solenoxyphus artemisiae Putshkov, 1978

Figures 16, 57

Solenoxyphus artemisiae Putshkov, 1978: 467–469.

DIAGNOSIS: Recognized by the large and dark dots on hind femora, structure of vesica

and color pattern of dorsum. Close to *S. lepidus* and *S. alkani* in coloration of hind femora but differs in dimensions, regular dotting on cuneus, short and robust apical process of vesica.

DESCRIPTION: VESTITURE: Composed only of silver simple adpressed setae.

COLORATION: Body (fig. 57) pale greenish; head and antennae uniformly pale, but first antennal segment in specimens from Uzbekistan darkened, only extreme base, apex and faltering midline on dorsal surface pale. Specimens from Turkmenistan with pale first antennal segment, although its inner surface with two distinct dark dots at bases of strong subapical setae. Pronotum, exposed part of mesoscutum and scutellum pale, often with indistinct, narrow whitish median stripe. Pronotum usually with a series of pale brown dots along basal margin. Dotting on forewings comparatively sparse and irregular, becomes denser and at times confluent in apical part of clavus, area along claval commissure and medioapical part of corium. In the palest specimens, dotting at bases and lateral sides of forewing absent. Whole cuneus covered with dots, slightly embrowned apically. Diameter of the largest dots on forewings $0.5\text{--}1.0 \times$ the width of second antennal segment at base. Membrane with indistinctly embrowned areas along outer and inner veins, oblong lateral spot separated from apex of cuneus by transparent rectangular stripe and small spot adjacent to apex of cuneus. Specimens from Turkmenistan with pale ventral surface, specimens from Uzbekistan with somewhat darkened mesothorax. Ventral surfaces of femora and apical parts of their dorsal surfaces covered with large and contrastingly dark dots. Hind femora with dark brown dots $3\text{--}5 \times$ as large as those on forewings. Tibia with distinct dark brown dots at bases of feebly embrowned tibial spines.

MALE GENITALIA: Vesica as in fig. 16; apical process comparatively robust and shortened, straight, nearly as long as width of vesica proximal to secondary gonopore. Longitudinal flange narrow but distinctly sclerotized. Series of teeth not extending proximal or distal to secondary gonopore.

STRUCTURE AND MEASUREMENTS: Labium greatly surpassing hind coxae, usually reaching genital segment. Females macropterous. Hind femora slightly swollen in both sexes.

In males, body 2.7–3.0 × as long as width of pronotum. Pronotum 2.0–2.1 × as wide as long, 1.4–1.6 × as wide as head. Vertex 1.5–1.6 × as wide as eye. Second antennal segment 0.7–0.8 × as long as basal width of pronotum, 1.0–1.2 × as long as width of head. Body length: 3.4–3.7 mm.

In females, body 2.4–2.5 × as long as width of pronotum. Pronotum 2.0–2.1 × as wide as long, 1.6 × as wide as head. Vertex 1.6 × as wide as eye. Second antennal segment 0.7 × as long as basal width of pronotum, 1.0–1.1 × as long as width of head. Body length: 3.0–3.1 mm.

NOTE: Putshkov (1978) distinguished this species from *S. lepidus* by the uniform dotting on the cuneus, as well as by small distinctions in the structure paraempodia and color pattern of the membrane, apparently by the presence of a small embrowned spot near the apex of cuneus. As in the case of *S. minor*, these characters are not sufficiently diagnostic to recognize *S. artemisiae*. However, this species can be distinguished from *S. lepidus* by the short and robust apical process of vesica, which is nearly as long as width of the vesica proximal to the secondary gonopore (fig. 16).

DISTRIBUTION: Turkmenistan, Uzbekistan. The indication of *S. artemisiae* from northern China (Qi et al., 1995) most probably should be referred to *S. lepidus*.

HOSTS AND NATURAL HISTORY: *Solenoxyphus artemisiae* was originally collected and described from *Artemisia badghysi* (Asteraceae) (Putshkov, 1978). According to long-term observations in Eastern Kara-Kum desert made by Kaplin (1993), the species feeds on *Kochia odontoptera*, *Londesia eriantha*, *Salsola sclerantha*, and *S. carinata* (Chenopodiaceae). The life cycle of *S. artemisiae* is similar to that of *S. loginovae* but development of the second generation takes place later. Larvae of the second generation were found by Kaplin in late June and their adults in early July. The species was collected in an average quantity of 0.1 specimens per plant.

SPECIMENS EXAMINED: Holotype: **UZBEKISTAN:** Bukantau Mts near Kulkuduk, May 1975, Muminov, 1 ♂ (AMNH_PBI 00140898).

Paratypes: 1 ♂ (AMNH_PBI 00140899) (UASK). Kyzylkum sands, 70 km S from Tamdy-Bulak, 01 May 1965, Narchuk, 1 ♂ (AMNH_PBI 00140892). **TURKMENISTAN:** Badkhyz Natural Reserve, 19 May 1976, Putshkov, 1 ♂ (AMNH_PBI 00140900), 3 ♀ (AMNH_PBI 00140891, AMNH_PBI 00140900) (UASK).

Solenoxyphus asanovae (Vinokurov, 1995),
new comb.

Figures 3, 4, 58, 59

Leucopteryx asanovae Vinokurov in Vinokurov and Kanyukova, 1995: 57–58.

DIAGNOSIS: Recognized by the dark dotting on pronotum and scutellum, long labium, dentate apex of vesica, and ratios. This species is undoubtedly the nearest relative of *S. nanophyti*. Both species have similar pattern of variability in body coloration and feed on the same host plant. Nevertheless, *S. asanovae* can be clearly distinguished from *S. nanophyti* by the absence of dark setae on pronotum and scutellum and length of the body, second antennal segment, and labium. The length of the second antennal segment is nearly equal to basal pronotal width in males of *S. nanophyti* and equal to width of the head in males of *S. asanovae*. The apex of vesica is dentate in *S. asanovae* (figs. 3, 4) and finely acute in *S. nanophyti* (fig. 2). In both sexes of *S. nanophyti* the labium reaches the base of abdomen only, while in *S. asanovae* the labium extends to abdominal segment seven. Males of *S. nanophyti* are larger than those of *S. asanovae*: body length is 4.1–4.4 mm in the former species and 3.4–3.6 mm in the latter. However, body length of the single male of *S. asanovae* from Mongolia is 4.2 mm (see description of *S. nanophyti* for details).

DESCRIPTION: VESTITURE: Head, pronotum, and scutellum covered only with silver curved setae. Forewings covered with a mixture of silver setae and adpressed straight pale brown setae.

COLORATION: Color pattern variable. Specimens from Kazakhstan (figs. 58, 59) and Mongolia darker than those collected from Uzbekistan. Head pale gray to brown (Kazakhstan, Mongolia), pale yellow to green-

ish (Uzbekistan). Clypeus, mandibular and maxillary plates usually dark brown (Kazakhstan, Mongolia), slightly embrowned or uniformly pale (Uzbekistan). Frons often with series of dark rays radiating from pale middle line of frons, almost entirely darkened in a few specimens from Kazakhstan. Vertex paler than frons, pale gray or yellowish, usually without dark markings. First antennal segment usually brown to dark gray in specimens from Kazakhstan and Mongolia, uniformly pale yellow, rarely with indistinct brown ring in specimens from Uzbekistan. Second antennal segment usually slightly embrowned (Kazakhstan, Mongolia), uniformly pale yellow (Uzbekistan). Third and fourth antennal segments uniformly pale yellow. Labium entirely darkened or with pale first segment. Pronotum, exposed part of mesoscutum and scutellum dirty yellow to pale brown, densely and irregularly covered with brown dots confluent in darkest specimens. Forewings whitish or yellowish, irregularly covered with brown dotting, almost obsolete at extreme base of wing. Membrane embrowned, usually with whitish veins. Thorax brown, in some specimens from Uzbekistan only slightly embrowned. Abdomen usually pale, embrowned in the darkest specimens. All femora brown with very apices pale (Kazakhstan, Mongolia) or pale brown (Uzbekistan). The palest specimens with uniformly pale fore- and middle femora. Tibiae pale, with slightly embrowned spines.

MALE GENITALIA: Vesica as in figs. 3 and 4. Apical process long and thin, longer than width of vesica proximal to secondary gonopore, with blunt, apically dentate apex. Longitudinal flange weakly developed. Series of teeth not extending distal to secondary gonopore; area proximal to secondary gonopore with a series of minute denticles.

STRUCTURE AND MEASUREMENTS: Labium almost reaching seventh abdominal segment. Hind femora comparatively thin in males, somewhat swollen in females. Females macropterous.

In males, body 3.1–3.2 × as long as width of pronotum. Pronotum 2.1 × as wide as long, 1.2–1.4 × as wide as head. Vertex 1.2 × as wide as eye. Second antennal segment 0.7–0.8 × as long as basal width of pronotum, 0.9–1.0 × as long as width of head. Body length: 3.4–4.2 mm.

In females, body 2.4–2.5 × as long as width of pronotum. Pronotum 2.1–2.3 × as wide as long, 1.2–1.3 × as wide as head. Vertex 1.4–1.5 × as wide as eye. Second antennal segment 0.6 × as long as basal width of pronotum, 0.7–0.8 × as long as width of head. Body length: 2.8–2.9 mm.

DISTRIBUTION: Kazakhstan, Uzbekistan, and Mongolia*.

HOST PLANT: *Nanophyton erinaceum* (Chenopodiaceae). Single female collected from *Anabasis salsa* is considered sitting record.

SPECIMENS EXAMINED: Holotype: **KAZAKHSTAN: Zhambul Prov.:** 65 km S Khantau, Karasay, 17 Jun 1978, I. M. Kerzhner, *Nanophyton* sp., 1 ♂ (AMNH_PBI 00141310).

Paratypes: **KAZAKHSTAN: Karaganda Prov.:** 40 km S of Atasu [Zhana-Arka], 23 Jun 1960, I. M. Kerzhner, 1 ♂ (AMNH_PBI 00141360). Karakengir 20 km S Dzhezkazgan, 08 Jun 1961, Emeljanov, *Anabasis salsa*, 1 ♀ (AMNH_PBI 00141362). Koksengir Mt., S of Atasu [Zhana-Arka], 05 Jun 1959, Emeljanov, *Nanophyton erinaceum*, 2 ♂ (AMNH_PBI 00141352, AMNH_PBI 00141354), 3 ♀ (AMNH_PBI 00141355–AMNH_PBI 00141357); 01 Jun 1959, Emeljanov, *Nanophyton erinaceum*, 1 ♂ (AMNH_PBI 00141353). **Zhambul Prov.:** 35 km NW Mynaral nr Balhash, 20 Jun 1978, I. M. Kerzhner, *Nanophyton* sp., 1 ♀ (AMNH_PBI 00141361). Karasay st N Shu [Chu], 17 Jun 1978, I. M. Kerzhner, 1 ♀ (AMNH_PBI 00141350). **UZBEKISTAN:** Ayakguzhumdy, Kyzylkum, 28 Jun 1976, I. M. Kerzhner, 1 ♀ (AMNH_PBI 00141351). Bukantau Mts near Kulkuduk, 13 May 1965, I. M. Kerzhner, *Nanophyton erinaceum*, 7 ♂ (AMNH_PBI 00141344–AMNH_PBI 00141349, AMNH_PBI 00141358), 1 ♀ (AMNH_PBI 00141359).

Additional material: Paratype of *S. nanophyti*: **MONGOLIA: Hovd Aimak:** 5 km NW Uench, 25 Jun 1980, I. M. Kerzhner, 1 ♂ (AMNH_PBI 00141766), 1 ♀ (AMNH_PBI 00141767).

Solenoxyphus candidatus (Reuter, 1879), new comb.

Figures 1, 66, 67

Leucopteryx candidatum Reuter, 1879: 260–261; Qi and Nonnaizab, 1997: 11–12 (redescription).

Leucopteryx longicollis Reuter, 1879: 260, n. syn.

Leucopteryx fasciatum Reuter, 1879: 261–262 (syn. by Kerzhner, 1962: 386).

Leucopteryx transversum Jakovlev, 1882: 127–128 (syn. by Kerzhner, 1962: 386).

DIAGNOSIS: The species is distinguished from all other members of the genus by the absence of dotting on the dorsum and more or less fuscate apex of the corium.

DESCRIPTION: VESTITURE: Entire body surface, except apex of corium, covered with silver simple setae. Apical margin of corium covered with straight pale brown setae. Darkened setae present in all examined specimens although reduced in the palest ones.

COLORATION: Body (figs. 66, 67) naturally greenish, pale yellow with greenish areas in dry specimens. Head, antennae, pronotum, and scutellum pale, without any color pattern. Forewings whitish, semitransparent, areas along claval sutures, apex of corium and sometimes cuneus pale yellow. Color pattern variable. Usually, corium apically darkened, forming pale brown or brown band with indistinct borders (fig. 66). In the darkest specimens, clavus embrowned at apex (fig. 67). Dotting absent, only embrowned apex of corium sometimes covered with dots. In the palest specimens, apices of clavus and corium without dark markings, uniformly pale yellow. Membrane transparent basally and more or less embrowned apically. Area of membrane distal to cuneal apex usually slightly darkened. Ventral surface pale, or with somewhat darkened mesosternum. Fore- and middle femora uniformly pale, rarely with a few indistinct dots on foremargins. Hind femora uniformly pale to entirely dark brown, virtually all intermediate states of this pattern revealed. All tibiae and tibial spines pale.

MALE GENITALIA: Vesica as in fig. 1. Apical process long, thin and acute, with somewhat curved apex, longer than width of vesica proximal to secondary gonopore. Longitudinal flange narrow, but distinctly sclerotized. Series of teeth not extending distal to secondary gonopore; area proximal to secondary gonopore covered with denticles. Degree of dentation proximal to secondary gonopore variable.

STRUCTURE AND MEASUREMENTS: Labium relatively short, barely reaching middle coxae.

Hind femora thin in males, slightly swollen in females. Females macropterous.

In males, body $3.6\text{--}3.8 \times$ as long as width of pronotum. Pronotum $1.8\text{--}2.0 \times$ as wide as long, $1.2\text{--}1.3 \times$ as wide as head. Vertex $1.5\text{--}1.7 \times$ as wide as eye. Second antennal segment $0.9\text{--}1.0 \times$ as long as basal width of pronotum, $1.3\text{--}1.4 \times$ as long as width of head. Body length: 4.5–5.6 mm.

In females, body $2.9\text{--}3.1 \times$ as long as width of pronotum. Pronotum $1.9\text{--}2.1 \times$ as wide as long, $1.3\text{--}1.4 \times$ as wide as head. Vertex $1.8\text{--}2.0 \times$ as wide as eye. Second antennal segment $0.7\text{--}0.8 \times$ as long as basal width of pronotum, as long as width of head. Body length: 4.0–4.4 mm.

NOTE: Both *Leucopteryx candidatum* and *L. longicollis* were described by Reuter (1879) in the same paper. According to the original descriptions, *L. candidatum* differs from *L. longicollis* in the larger body, shorter second antennal segment, more intense pale brown transverse stripe on forewings and presence of dark stripe on foremargin of hind femora. *L. longicollis* was described from a single male and has not been recorded later. The holotype of this species, kept at the Zoological Museum of the Moscow University, is badly damaged with the abdomen, antennae, and all legs are lost. Examination of material from the collection of Zoological Institute, including specimens collected near the type locality of *L. longicollis*, revealed a wide variability in the body coloration and size, so that it is impossible to separate any isolated group; therefore, *L. longicollis* is synonymized with *L. candidatum*.

DISTRIBUTION: Russia (Dagestan), Armenia, Georgia (Zaitseva, 1998), Azerbaijan, north-eastern and eastern Kazakhstan, Turkmenistan*, Iran, Tajikistan, Kyrgyzstan*, and northwestern China (Qi and Nonnaizab, 1997).

HOST PLANTS: *Suaeda microphylla*, *S. physophora*, *Suaeda* sp. (Chenopodiaceae). *Salsola* sp. (Chenopodiaceae) is (erroneously?) indicated on label of one specimen from Azerbaijan. Indication of *Artemisia* (Asteraceae) as a host plant (Qi and Nonnaizab, 1997) is most probably erroneous.

SPECIMENS EXAMINED: Holotype of *Leucopteryx longicollis*: **KAZAKHSTAN: Kyzylorda Prov.:** Mt. Karak, (nr Bayrakkum on

Syr-Darya, 7 May 1871, Fedtshenko), 1 ♂ without USI label, (ZMMU). Holotype of *Leucopteryx fasciatus*: **RUSSIAN FEDERATION: Astrakhan Prov.:** without locality label, (Mt. Bolshoe Bogdo) No 156, V.E. Jakovlev, 1 ♀ (AMNH_PBI 00140551). Holotype of *Leucopteryx candidatum*: **Dagestan Rep.:** without locality label [Derbent], V.E. Jakovlev, 1 ♂ (AMNH_PBI 00140555). Lectotype of *Leucopteryx transversum*: Derbent, V.E. Jakovlev, 1 ♀ (AMNH_PBI 00140552).

Paralectotypes of *Leucopteryx transversum*: 2 ♀ (AMNH_PBI 00140553, AMNH_PBI 00140554).

Additional material: **ARMENIA:** Ararat [Davalu], valley of Araks river, 17 Jul 1931, Korinek, 7 ♂ (AMNH_PBI 00140542–AMNH_PBI 00140548). Metsamor [former Kamarlu] Railway Station, 14 Jul 1931, Korinek, 1 ♂ (AMNH_PBI 00140539), 2 ♀ (AMNH_PBI 00140540, AMNH_PBI 00140541). Yerevan, 28 Jun 1932, Korinek, 1 ♂ (AMNH_PBI 00140538). **AZERBAIJAN:** Samux [Samuch], 20 Jun 1947, Unknown collector, *Salsola* sp., 1 ♂ (AMNH_PBI 00140549). Sumgait nr Baku, 06 May 1938, Bogachev, 1 ♀ (AMNH_PBI 00140550). **IRAN: Semnan:** Emamshachr [Shachrud], 28 May 1914, A. N. Kiritshenko, 9 ♂ (AMNH_PBI 00140258–AMNH_PBI 00140262, AMNH_PBI 00140268–AMNH_PBI 00140270, AMNH_PBI 00140505); 29 May 1914, A. N. Kiritshenko, 3 ♂ (AMNH_PBI 00140254, AMNH_PBI 00140256–AMNH_PBI 00140257); 30 May 1914, A. N. Kiritshenko, 16 ♂ (AMNH_PBI 00140263–AMNH_PBI 00140267, AMNH_PBI 00140506–AMNH_PBI 00140515, AMNH_PBI 00140537); 05 Jun 1914, A. N. Kiritshenko, 2 ♂ (AMNH_PBI 00140516, AMNH_PBI 00140517); 06 Jun 1914, A. N. Kiritshenko, 2 ♂ (AMNH_PBI 00140518, AMNH_PBI 00140519). **KAZAKHSTAN: Akmola Prov.:** Tengiz lake, 10 km S Kulanutpes mouth, 09 Jun 1962, I. M. Kerzhner, *Suaeda physophora*, 1 ♀ (AMNH_PBI 00140646). **East Kazakhstan Prov.:** Burkhatka picket, Zaysan, 22 Jun 1930, Lukyanovich, 3 ♂ (AMNH_PBI 00140641, AMNH_PBI 00140642), 4 ♀ (AMNH_PBI 00140637–AMNH_PBI 00140640). **Karaganda Prov.:** 40 km S of Atasu [Zhana-Arka], 23 Jun 1960, I. M. Kerzhner, *Suaeda physophora*, 1 ♀ (AMNH_PBI 00140645).

Kostanay Prov.: 200 km SO Qyzylorda, nr Tyshkanbay [Akkum], 30 Jun 1966, I. M. Kerzhner, 3 ♀ (AMNH_PBI 00140536) *Suaeda microphylla*, 16 ♂ (AMNH_PBI 00140521–AMNH_PBI 00140528), 10 ♀ (AMNH_PBI 00140530–AMNH_PBI 00140535). **Kyzylorda Prov.:** Dzhulek [Zhulek], 30 Jun 1904–02 Jul 1904, V. Oshanin coll., *Suaeda microphylla*, 1 ♀ (AMNH_PBI 00140520). **Zhambul Prov.:** Karasay st N Shu [Chu], 16 Jul 1960, Emeljanov and Kerzhner, *Suaeda* sp., 2 ♂ (AMNH_PBI 00140635, AMNH_PBI 00140636), 1 ♀ (AMNH_PBI 00140634) *Suaeda physophora*, 1 ♀ (AMNH_PBI 00140633). **KYRGYZSTAN:** 50 km S Chaek, 07 Jul 1986, Volkovich, 1 ♂ (AMNH_PBI 00140648). Naryn, 10 Jul 1966, I. M. Kerzhner, *Suaeda physophora*, 1 ♂ (AMNH_PBI 00140649), 1 ♀ (AMNH_PBI 00140649). **TAJIKISTAN:** Qurghonteppa [Kurgan-Tyube], 12 Aug 1939, Kryzhanovskij, 1 ♀ (AMNH_PBI 00140647). **TURKMENISTAN:** 50 km NW Tejen [Tedzhen], 28 Aug 1962, Guliev, 1 ♂ (AMNH_PBI 00140644). Babadurmaz [Baba-Durmas], 50 km SE Ashkhabad, 16 May 1972, Loginova, *Suaeda microphylla*, 4 ♀ (AMNH_PBI 00140632). Bayramali, 03 Aug 1933, Bogush, 2 ♂ (AMNH_PBI 00140625, AMNH_PBI 00140626), 1 ♀ (AMNH_PBI 00140627); 09 Sep 1930, Bogush, 1 ♀ (AMNH_PBI 00140628). Gazanjyk [Kazandzik], 28 Apr 1889, Semenov, 2 ♂ (AMNH_PBI 00140643). Imambaba, Mary [Merv], 24 Apr 1912–25 Apr 1912, Kozhanchikov, 1 ♂ (AMNH_PBI 00140556); 28 Apr 1912–01 May 1912, Kozhanchikov, 1 ♂ (AMNH_PBI 00140622), 2 ♀ (AMNH_PBI 00140623, AMNH_PBI 00140624). Kuryan-Dag, nr Gazanjyk [Kazandzhik], 27 Aug 1889–28 Aug 1889, Semenov, 1 ♂ (AMNH_PBI 00140630), 1 ♀ (AMNH_PBI 00140631). Kushka, Mary [Merv], 02 Jul 1912, Kozhanchikov, 1 ♀ (AMNH_PBI 00140629).

Solenoxyphus fuscovenosus (Fieber, 1864)

Figures 8, 9, 48, 51–54, 63, 64

Capsus halimocnemis Becker, 1864 (August or September): 485 (nomen oblitum, syn. by Kerzhner, in Kerzhner and Jaczewski, 1964: 752).
Psallus? fuscovenosus Fieber, 1864 (November): 330.

Solenoxyphus crassipes Reuter, 1879: 257–258 (unnecessary new name for *Psallus fuscovenosus* Fieber, erroneously considered a separate species by Wagner, 1969).

Solenoxyphus reticulatus Reuter, 1900: 260–261 (syn. by Horváth, 1903: 556).

Solenoxyphus fuscovenosus f. *cruenta* Stichel, 1956: 252. Considered by Wagner and Weber, 1964: 540 as a variety of *S. lepidus*.

DIAGNOSIS: The species is easily distinguished by the characteristic reticulate color pattern on membrane. However, the palest specimens with a reduced reticulate pattern can be confused with *S. punctipennis*. Both *S. fuscovenosus* and *S. punctipennis* have similar color pattern on forewings, composed of minute and rather regularly distributed dots, but differ in the structure of apical process of the vesica, which is distinctly shorter and more robust in the former species.

DESCRIPTION: VESTITURE: Entire body surface covered only with long silver setae, usually adpressed on forewings (fig. 52), semierect on pronotum and scutellum.

COLORATION: Body greenish to pale yellow. Head and antennae uniformly pale. Pronotum, exposed part of mesoscutum and scutellum pale, often with whitish midline. Basal part of pronotum and whole or apical part of scutellum covered with minute pale brown dotting. In the palest specimens, this dotting remaining only at basal corners of pronotum or absent. Whole forewing except membrane rather regularly and very densely covered with minute gray dots. In the palest specimens dotting becomes obsolete at extreme base of wing. Diameter of dots on forewings not more than half the width of second antennal segment at base. Membrane with characteristic, but variable color pattern. Typically, larger cell and whole area along lateral margin of membrane contrastingly embrowned, the rest part with reticulate, somewhat resembling brown venation pattern (fig. 64). Smaller cell and rectangular stripe just behind apex of cuneus usually transparent. Reticulate pattern and, to a lesser extent, embrowned lateral area often reduced, sometimes very pale and barely visible or even completely absent. Loss of reticulate pattern usually occurs in specimens with wholly embrowned cells and brown edging along outer vein (fig. 63). Ventral surface pale.

Femora with minute brown dotting on apical parts of dorsal surfaces and whole ventral surfaces. In the palest specimens dotting on fore- and middle femora somewhat reduced. Hind femora with well-developed dotting of same color as dots on forewings. Dots on hind femora equal in diameter to those on forewings or slightly larger. Tibia pale, with minute, but always clearly visible brown dots at bases of embrowned tibial spines.

MALE GENITALIA: Vesica as in figs. 8, 9, apical process comparatively robust and shortened, straight, nearly as long as width of vesica proximal to secondary gonopore. Longitudinal flange well developed. Series of teeth comparatively long, extending somewhat proximal to secondary gonopore.

STRUCTURE AND MEASUREMENTS: Labium at least slightly surpassing hind coxae, often reaching fourth abdominal segment. Hind femora swollen in males and especially females. Females macropterous.

In males, body $3.0\text{--}3.3 \times$ as long as width of pronotum. Pronotum $2.0\text{--}2.2 \times$ as wide as long, $1.2\text{--}1.3 \times$ as wide as head. Vertex $1.3\text{--}1.5 \times$ as wide as eye. Second antennal segment $0.8\text{--}1.0 \times$ as long as basal width of pronotum, $1.0\text{--}1.3 \times$ as long as width of head. Body length: 3.0–3.8 mm.

In females, body $2.7\text{--}3.2 \times$ as long as width of pronotum. Pronotum $2.0\text{--}2.2 \times$ as wide as long, $1.2\text{--}1.4 \times$ as wide as head. Vertex $1.7\text{--}2.0 \times$ as wide as eye. Second antennal segment $0.6\text{--}0.8 \times$ as long as basal width of pronotum, $0.8\text{--}1.1 \times$ as long as width of head. Body length: 3.0–3.9 mm.

DISTRIBUTION: Austria, Hungary, Romania, Slovakia (Hoberlandt, 1977), Turkey (Reuter, 1900), Azerbaijan (Kiritshenko, 1918), southern Ukraine, southern part of European Russia, Kazakhstan, Turkmenistan, Iran (Kerzhner and Josifov, 1999). The species was also recorded from Konstantinovskaya St. (N of Bishkek, Kyrgyzstan) near Kazakhstan frontier by Sahlberg (1904). *S. crassipes* was indicated from Tashkent (Uzbekistan) by Reuter (1883).

HOST PLANTS: Wagner (1969) reported *Camphorosma annua* (Chenopodiaceae) as the host plant of *S. fuscovenosus*. According to his observations (Wagner, 1975) the species has a monovoltine life cycle and imago were found in August and September. *Capsus*

halimocnemis Becker, 1864 was described from *Halimocnemis glauca* (Chenopodiaceae, this species is currently placed in *Petrosimonia*) and *Halimocnemis crassifolia* (junior synonym of *Petrosimonia oppositifolia*). In northwestern Kazakhstan representatives of this species were collected from *Halocnemum strobilaceum* (Chenopodiaceae) and *Petrosimonia oppositifolia*, in northeastern Kazakhstan from *Suaeda* sp. (Chenopodiaceae).

SPECIMENS EXAMINED: Lectotype of *Capsus halimocnemis*: **Volgograd Prov.:** Krasnoarmeysk [former Sarepta], Becker, 1♀ (AMNH_PBI 00140765).

Paralectotypes of *Capsus halimocnemis*: same label as lectotype, 4♀ (AMNH_PBI 00140783–AMNH_PBI 00140786); same label as lectotype, on *Halimocnemis glauca* 5♂ (AMNH_PBI 00140778–AMNH_PBI 00140782), 6♀ (AMNH_PBI 00140776–AMNH_PBI 00140777, AMNH_PBI 00140787–AMNH_PBI 00140790); same label as lectotype, sweeping on *Halimocnemis glauca* & *H. oppositifolia* 10♀ (AMNH_PBI 00140766–AMNH_PBI 00140775).

Additional material: **AUSTRIA:** Burgenland, Illmitz, 20 Aug 1960, 2♀, without USI label (JR). **HUNGARY:** Dorosma, 19 Aug 1887, 2♂, without USI label (MNHN). **KAZAKHSTAN:** **Atyrau Prov.:** mouth of Ural River, Island nr channels Zolotaya and Zaruslaya, 29 Jul 1934, Petrov, 1♂ (AMNH_PBI 00140753). **Karaganda Prov.:** 40 km S of Atasu [Zhana-Arka], 03 Jun 1960, I. M. Kerzhner, *Suaeda* sp., 1♂ (AMNH_PBI 00137103), 1♀ (AMNH_PBI 00137104) (AMNH). *Suaeda* sp., 9♂ (AMNH_PBI 00140798–AMNH_PBI 00140801, AMNH_PBI 00140812–AMNH_PBI 00140816), 3♀ (AMNH_PBI 00140804–AMNH_PBI 00140806). **Kostanay Prov.:** 250 km S Kustanai, Ak-Suat Lake, 01 Aug 1935, Formozov, 1♂ (AMNH_PBI 00140857), 4♀ (AMNH_PBI 00140874–AMNH_PBI 00140877). **Kyzylorda Prov.:** 30 km SE of Turkistan, Ajak-kol Lake, 14 May 1994, F. Konstantinov, *Suaeda* sp., 17♂ (AMNH_PBI 00140808–AMNH_PBI 00140810, AMNH_PBI 00140843–AMNH_PBI 00140852), 17♀ (AMNH_PBI 00140830–AMNH_PBI 00140831, AMNH_PBI 00140832–AMNH_PBI 00140842). Dzhulek [Zhulek], 01 May 1909–01 Jun 1909, Kozhanchikov, 1♂ (AMNH_PBI 00140752). **Mangistau Prov.:** Kizyl-Tash, coast of Kaydak Gulf, Caspian sea, 12 Aug 1934, Rezvoy,

1♂ (AMNH_PBI 00140881); 29 Jul 1934, Rezvoy, 2♀ (AMNH_PBI 00140858, AMNH_PBI 00140859). **West Kazakhstan Prov.:** Khaki nr Urda, 03 Jul 1961, Emeljanov and Kerzhner, 1♀ (AMNH_PBI 00140807). Saikhin, 30 Jun 1961, I. M. Kerzhner, *Petrosimonia oppositifolia*, 1♀ (AMNH_PBI 00137105) (AMNH); 30 Jun 1961, Emeljanov and Kerzhner, 3♀ (AMNH_PBI 00140819, AMNH_PBI 00140824, AMNH_PBI 00140829) *Petrosimonia oppositifolia*, 5♀ (AMNH_PBI 00140802–AMNH_PBI 00140803, AMNH_PBI 00140826–AMNH_PBI 00140828) *Halocnemum strobilaceum*, 7♂ (AMNH_PBI 00140791–AMNH_PBI 00140797), 5♀ (AMNH_PBI 00140820–AMNH_PBI 00140823, AMNH_PBI 00140825). **ROMANIA:** **Valachie:** Laeu Saral, Montadon, 1♂, without USI label (MNHN). **RUSSIAN FEDERATION:** **Astrakhan Prov.:** 100 km SW Astrakhan, 15 Jul 1961, Emeljanov and Kerzhner, annual Chenopodiaceae, 1♀ (AMNH_PBI 00140855). El'ton Lake, 05 Jul 1961, Emeljanov and Kerzhner, annual Chenopodiaceae, 1♂ (AMNH_PBI 00140854), 1♀ (AMNH_PBI 00140853). **Dagestan Rep.:** Makhachkala [former Petrovsk], 27 Jul 1926, Ryabov, 1♂ (AMNH_PBI 00140879). **Krasnodar Terr.:** Novonikolaevskaya Stanitsa, 29 Jun 1934, Rysakov, 1♀ (AMNH_PBI 00140890). **Orenburg Prov.:** Left bank of Ural River, Verkhnedneprovka, 17 Jul 1934, L. Zimin, 2♂ (AMNH_PBI 00140896, AMNH_PBI 00140897), 2♀ (AMNH_PBI 00140888, AMNH_PBI 00140889). **TURKEY:** 50 km S of Aksaray, 07 Aug 1963, Linnavuori, 2♂ (AMNH_PBI 00137127, AMNH_PBI 00137128), 1♀ (AMNH_PBI 00137129) (AMNH). **TURKMENISTAN:** Ashgabat [Ashkhabad], 06 May 1932, E. Kuznetsova, 1♀ (AMNH_PBI 00140878). Kara-Bogaz, 40 km N Gyzylarbat [Kizyl-Arvat], 07 May 1953, Odintsova, Light Trap, 1♂ (AMNH_PBI 00140880). **UKRAINE:** Nr Primorsk [former Nogaik], 24 Jun 1940, Lukyanovich, 1♂ (AMNH_PBI 00140895). Potoki nr Kremenchuk, 10 Jul 1940, Lukyanovich, 1♀ (AMNH_PBI 00140884); 10 Aug 1939–11 Aug 1939, Lukyanovich, 3♀ (AMNH_PBI 00140885–AMNH_PBI 00140887). Solenyi Liman nr Znamenka, Dnepropetrovsk Distr., 16 Jul 1939, Lukyanovich, 2♀ (AMNH_PBI 00137101, AMNH_PBI 00137102). (AMNH). 2♂ (AMNH_PBI 00140866, AMNH_PBI 00140867), 4♀ (AMNH_PBI 00140861–

AMNH_PBI 00140864); 20 Jun 1940, Lukyanovich, 1♂ (AMNH_PBI 00140868), 1♀ (AMNH_PBI 00140860). Zanki nr Zmiyev [Zmiyev], 08 Jul 1940, Lukyanovich, 2♀ (AMNH_PBI 00140882, AMNH_PBI 00140883). **Crimea:** Eupatoria, 27 Jul 1902, V.E. Jakovlev, 1♂ (AMNH_PBI 00140785). Kerch, 19 Aug 1918, A. N. Kiritshenko, 1♂ (AMNH_PBI 00140817); 09 Jul 1918, A. N. Kiritshenko, 1♀ (AMNH_PBI 00140818); 02 Sep 1917, A. N. Kiritshenko, 5♀ (AMNH_PBI 00140869–AMNH_PBI 00140873); 05 Sep 1917, A. N. Kiritshenko, 6♂ (AMNH_PBI 00140856, AMNH_PBI 00140869–AMNH_PBI 00140873).

Solenoxyphus halocnemi (Putshkov, 1984)
new comb.

Figures 6, 7, 60

Leucopteryx halocnemi Putshkov, 1984: 28.

DIAGNOSIS: Distinguished by the large dimensions, presence of dark setae, regular minute dotting on dorsum and vesica structure. Close to *S. pallens* but differs in larger size and darker dotting on forewings. Vesica in *S. halocnemi*, unlike *S. pallens*, has well-developed series of teeth running to base of apical process.

DESCRIPTION: VESTITURE: Setae on head, pronotum, scutellum, and ventral surface silver. Forewings with silver setae only at bases and laterally while the entire surface of wing covered with straight adpressed pale brown setae.

COLORATION: Body (fig. 60) greenish to pale yellow. Head and antennae pale, without any color pattern. Pronotum and scutellum pale yellow, usually with greenish basal and apical parts. Clavus, corium and cuneus yellow, whole-colored, covered with remarkably minute and depressed pale brown dots. Dotting on forewings regularly distributed, discolored or absent only at extreme base of wing and basal part of cuneus. Membrane wholly transparent or slightly embrowned, in one female from Kazakhstan with distinctly embrowned cells. Thorax, legs, and abdomen uniformly pale, without any markings. Tibial spines gently embrowned.

MALE GENITALIA: Vesica robust, as in figs. 6 and 7. Apical process long and acute,

tapering, with somewhat curved apex, longer than width of vesica proximal to secondary gonopore. Longitudinal flange narrow, but distinctly sclerotized. Series of teeth extending from area proximal to secondary gonopore to base of apical process.

STRUCTURE AND MEASUREMENTS: Labium slightly surpassing middle coxae, darkened apically. Hind femora comparatively thin in males, somewhat swollen in females. Females macropterous.

In males, body 3.0–3.1 × as long as width of pronotum. Pronotum 2.0–2.2 × as wide as long, 1.4 × as wide as head. Vertex 1.1–1.2 × as wide as eye. Second antennal segment 0.9 × as long as basal width of pronotum, 1.2 × as long as width of head. Body length: 4.8–5.0 mm.

In females, body 2.3–2.4 × as long as width of pronotum. Pronotum 2.1–2.2 × as wide as long, 1.3–1.4 × as wide as head. Vertex 1.5 × as wide as eye. Second antennal segment 0.6–0.7 × as long as basal width of pronotum, 0.9 × as long as width of head. Body length: 4.1–4.3 mm.

NOTE: This species was hitherto known only from the type locality (Molla-Kara near Dzhebel (Turkmenistan), where it was collected from *Halocnemum strobilaceum*. Twelve specimens from Shekaftar (Kyrgyzstan) and Balhash railway station (Kazakhstan), which were collected from *Anabasis truncata*, were revealed during this study. All the specimens were found to be indistinguishable from the type series in measurements, ratios, color pattern, vestiture, and structure of the male genitalia (figs. 6, 7). These specimens are herein identified as *S. halocnemi*. Apparently, more extensive material is needed to clarify the interrelationships and host associations in *S. pallens* group of species.

DISTRIBUTION: Kazakhstan*, Kyrgyzstan*, Turkmenistan, and Mongolia*.

HOST PLANTS: *Halocnemum strobilaceum*, *Anabasis truncata* (Chenopodiaceae).

SPECIMENS EXAMINED: Paratypes: **TURKMENISTAN:** Dzhebel, 16 Sep 1976, Putshkov, *Halocnemum strobilaceum*, 1♂, 1♀ (AMNH_PBI 00140676). Mollakara, 18 Sep 1976, Putshkov, *Halocnemum strobilaceum*, 1♂ (AMNH_PBI 00140674), 1♀ (AMNH_PBI

00140677). **KAZAKHSTAN:** Karaganda Prov.: 12 km E Balqash [Balhash], 18 Jun 1962, I. M. Kerzhner, *Anabasis truncata*, 1♀ (AMNH_PBI 00140673). **KYRGYZSTAN:** Shekaftar, Fergana valley, 19 Jun 1966, I. M. Kerzhner, *Anabasis truncata*, 4♂ (AMNH_PBI 00140668) 7♀ (AMNH_PBI 00140670–AMNH_PBI 00140672). **MONGOLIA:** Hovd Aimak: Lower of Bodonchin-Gol River, 20 km SW Bor-Udzuur [Altai somon], 04 Aug 1968, Emeljanov, 1♀ (AMNH_PBI 00140675).

Solenoxyphus kerzhneri, n. sp.

Figures 19–21, 24, 25, 26, 30, 46, 74

DIAGNOSIS: Close to *S. major* and *S. pallens*. It is difficult to distinguish from *S. major* by external characters, but differs in the vesica structure, namely the strongly reduced longitudinal flange and extension of a series of teeth proximal to secondary gonopore. Differs from *S. pallens* in the presence of pale brown dots at the bases of tibial spines. In addition, dotting on forewings in *S. kerzhneri* is usually irregular, darker, and denser than in *S. pallens*. Forewings are covered only with light silver setae in the former species and with pale brown setae in the latter. *Solenoxyphus kerzhneri* differs from *S. loginovae* in dotting pattern of forewings.

DESCRIPTION: VESTITURE: Entire body surface covered with silver, straight or curved setae only.

COLORATION: Head pale yellow or greenish, eyes black to pale brown. Antennae uniformly whitish yellow, without any markings. Pronotum and scutellum pale yellow and usually in part greenish, devoid of any dark markings and spots. Clavus, corium, and cuneus uniformly pale yellow, with rather dense and irregular pale brown dotting, almost obsolete at extreme base of wing. Dots on apices of clavus and corium usually more dense and at times confluent. Dots on cuneus smaller than those on clavus and corium and more regularly distributed. Membrane smoky hyaline or very slightly and uniformly embrowned. Ventral surface pale. Legs pale yellow; all femora apically with distinct sparse, pale brown dots. Hind femora comparatively thin in males, somewhat swol-

len in females. Dotting on dorsal surface of hind femora usually running from apex to hind margin. Tibia with distinct pale brown dots at bases of tibial spines. Tibial spines pale. Apical part of third tarsal segment and claws darkened.

MALE GENITALIA: Theca and parameres as in figs. 19, 24, 25. Apical process of vesica (figs. 20–21, 30) long, thin, and acute, with somewhat curved apex, distinctly longer than width of vesica proximal to secondary gonopore. Longitudinal flange remarkably narrow and weakly sclerotized. Series of teeth not extending distal to secondary gonopore, prolonged into long series of denticles proximally.

STRUCTURE AND MEASUREMENTS: Body almost parallel-sided in males (fig. 74), elongate-oval in females. Head wider than high, declivent, weakly projecting beyond eyes. Labium always extending beyond hind coxae, almost reaching seventh abdominal segment in some females. Tarsi thin (fig. 46), claw as in fig. 26.

In males, body 3.5–3.7 × as long as width of pronotum. Pronotum 2.0–2.1 × as wide as long, 1.3–1.5 × as wide as head. Vertex 1.2–1.3 × as wide as eye. Second antennal segment 0.9–1.0 × as long as basal width of pronotum, 1.2–1.3 × as long as width of head. Body length: 3.8–5.0 mm.

In females, body 2.7–3.0 × as long as width of pronotum. Pronotum 2.0–2.2 × as wide as long, 1.3 × as wide as head. Vertex 1.3–1.4 × as wide as eye. Second antennal segment 0.7–0.8 × as long as basal width of pronotum, 0.9–1.0 × as long as width of head. Body length: 3.3–3.9 mm.

DISTRIBUTION: Kazakhstan, Kyrgyzstan.

HOST PLANT: *Salsola gemmascens* (Chenopodiaceae).

ETYMOLOGY: The new species is dedicated to the distinguished heteropterist Prof. I. M. Kerzhner.

SPECIMENS EXAMINED: Holotype: **KYRGYZSTAN:** 80 km W Naryn, Central Tian Shan, 11 Jul 1966, I. M. Kerzhner, *Salsola gemmascens*, ♂ (AMNH_PBI 00140651).

Paratypes: **KYRGYZSTAN:** same label as holotype, 4♂ (AMNH_PBI 00140653–AMNH_PBI 00140655), 2♀ (AMNH_PBI 00140656, AMNH_PBI 00140655). Aktala mouth 80 km

Naryn, 10 Jul 1966, Emeljanov, 4 ♂ (AMNH_PBI 00140657, AMNH_PBI 00140658), 2 ♀ (AMNH_PBI 00140650). **KAZAKHSTAN: Mangistau Prov.:** S Usturt, chink Burchliburun, 04 Aug 1987, Mitrashina, *Salsola gemmascens*, 1 ♂ (AMNH_PBI 00140659). S Usturt, chink Burchliburun, 04 Aug 1987, Mitroshina, *Salsola gemmascens*, 5 ♀ (AMNH_PBI 00140660).

Solenoxyphus lepidus (Puton, 1874)

Figures 13–15, 49, 62, 65

Macrocoelus lepidus Puton, 1874: 222–223.

Solenoxyphus parvulus Reuter, 1894: 141–142 (syn. by V.G. Putshkov, 1978: 470).

Compsidolon gobicus Nonnaizab and Yang, 1994: 17–18 (syn. by Qi and Nonnaizab, 1995: 227).

Solenoxyphus minor Wagner, 1969: 73–75 (n. sp.) n. syn.

DIAGNOSIS: *Solenoxyphus lepidus* is undoubtedly closely related to *S. alkani* and *S. artemisiae*. This group of species can be easily recognized by the color pattern of femora. Dots on hind femora are at least 1.5–2 × as large as and contrastingly darker than those on forewings in all three species. *S. alkani* can be distinguished from other species by the large eyes, larger body length and short labium. *S. artemisiae* is barely distinguishable from *S. lepidus* by external characters, but differs in the structure of vesica. The apical process of vesica is short and robust in the former species, long and thin in the latter.

DESCRIPTION: VESTITURE: Entire body surface covered only with silver, remarkably long, semierect, slightly curved or straight setae.

COLORATION: Body pale yellow to greenish (figs. 62, 65). Head and antennae uniformly pale. Inner surface of first antennal segment often with two minute dark dots at bases of strong subapical setae. Pronotum, exposed part of mesoscutum and scutellum usually without dark markings, often with indistinct narrow whitish median stripe. Basal part of pronotum, base and apex of scutellum sometimes covered with minute brown dots; rarely entire pronotum and scutellum with minute dotting. Forewings with variable color pattern, covered with somewhat irregularly distributed brown dots. Diameter of the largest dots on forewings 0.5–1.0 × the width of second antennal segment at base. Typically,

apical part of clavus, area along claval commissure, and medioapical part of corium with dense, at times confluent, dotting. Dotting on forewings becoming sparser and paler basally and laterally. In the palest specimens, dotting at bases and lateral sides of forewing absent. Rarely, whole clavus and corium covered with dense dotting. Claval commissure usually slightly darkened. Lateroapical angle of corium usually embrowned. Cuneus usually with minute brown or reddish dots apically and along inner margin, often without dotting at all. Apical part of cuneus or at least inner cuneal margin usually reddish or embrowned. Basal part of cuneus devoid of dots or with a few obsolete and discolored dots, exceptionally with regular dotting. Membrane whitish, typically with indistinctly bordered embrowned area around outer vein, distinct wedge-shaped embrowned lateral spot separated from apex of cuneus by transparent rectangular stripe and small spot adjacent to apex of cuneus. Smaller cell and veins usually whitish. Spot along apex of cuneus and, rarely, wedge-shaped spot hardly visible or even absent in the palest specimens. Ventral surface pale. All femora apically covered with large brown dots. Dotting on fore- and middle femora sparse, becoming denser on ventral surface of femora. Dorsal surfaces of hind femora with series of large, remarkably dark brown dots apically and along foremargin. Dots on hind femora typically 2–4 × as large as those on forewings. Ventral surfaces of hind femora densely covered with dark brown dots often fused into transverse stripes. Tibia with brown dots at bases of tibial spines. In the palest specimens, these dots indistinct at foretibia, but always clearly visible at hind ones. Tibial spines pale or very slightly embrowned.

MALE GENITALIA: Vesica as in figs. 13–15. Apical process long, thin, and acute, with somewhat curved apex, distinctly longer than width of vesica proximal to secondary gonopore. Longitudinal flange reduced. Series of teeth not extending proximal or distal to secondary gonopore.

STRUCTURE AND MEASUREMENTS: Labium greatly surpassing hind coxae, nearly always reaching fourth abdominal segment. Hind femora distinctly swollen. Females macropterous. Tarsi as in fig. 49.

In males, body 2.8–3.2 × as long as width of pronotum. Pronotum 1.9–2 × as wide as long, 1.4–1.5 × as wide as head. Vertex 1.4–1.5 × as wide as eye. Second antennal segment 0.7–0.8 × as long as basal width of pronotum, 1.0–1.1 × as long as width of head. Body length: 3.0–3.8 mm.

In females, body 2.8–3.1 × as long as width of pronotum. Pronotum 1.9–2.0 × as wide as long, 1.3–1.5 × as wide as head. Vertex 1.5–1.7 × as wide as eye. Second antennal segment 0.7–0.8 × as long as basal width of pronotum, 1.0–1.1 × as long as width of head. Body length: 2.8–3.8 mm.

NOTE: According to the original description (Wagner, 1969), *S. minor* is undoubtedly related to *S. lepidus*, but differs in the smaller size, narrower vertex, distinctions in color pattern of the membrane, and absence of reddish markings on cuneus. The latter point was of crucial significance for Wagner. His diagnosis of *S. lepidus* was based on the color pattern of cuneus, i.e., presence of reddish markings on its apical part and absence of brown dotting. Examination of a considerable number of specimens of *S. lepidus* from various localities shows that reddish markings on cuneus can be absent although they are typical for most specimens. Moreover, the darkest specimens from different localities have well-developed brown dotting in the apical part or even the whole cuneus may be covered with brown dots. Even the lectotype of *S. lepidus* has minute, but clearly recognizable brown dots in the apical part of cuneus. No distinctions were found in the structure of the vesica (fig. 15), color pattern of membrane, and ratios. All examined specimens of *S. minor* have minute brown dotting on pronotum, exposed part of mesoscutum, and scutellum; dark brown dots on hind femora only 1.5–2.0 × as large as those on forewings. Both features are atypical for *S. lepidus*, but occur in some specimens. The original description of *S. lepidus* by Puton (1874) was based on a male from Sarepta (now Krasnoarmeysk near Volgograd, Russia) designated as lectotype by Wagner (1969) and a series of paralectotypes collected at Balaruc (Hérault, France) from *Camphorosma monspeliaca*. *Solenoxyphus minor* was originally described from St. Gabriel (Chaine des

Alpines, France) and collected from the same host plant. On the grounds of the foregoing discussion *S. minor* is synonymized with *S. lepidus*.

DISTRIBUTION: Spain, France, Macedonia (Göllner-Scheiding, 1978), Romania (Sienkiewicz, 1964), Algeria (Eckerlein and Wagner, 1965), southern part of European Russia, Armenia*, Ukraine, European and Asian parts of Kazakhstan, Kyrgyzstan, Uzbekistan*, Turkmenistan*, eastern Siberia, Mongolia, and northern and northwestern China (Nonnaizab and Yang, 1994; Qi and Nonnaizab, 1996).

HOST PLANTS: *Kochia prostrata* (Astrakhan Prov. and Tuva), *Kochia arenaria* (Wagner, 1969, Kursk Prov.), *Camphorosma* sp. (Astrakhan Prov.). Putshkov (1971) indicated *Kochia prostrata* and *K. laniflora* as host plants for *S. parvulus* in Ukraine. *S. minor* was described from *Camphorosma monspeliaca* (Wagner, 1969). All these host plants belong to the family Chenopodiaceae, but Qi and Nonnaizab (1996) indicated *Artemisia* sp. (Asteraceae) as the host plant for *S. lepidus* in northwestern China. Three specimens were taken on *Pyrethrum kasachstanicum*. (Asteraceae) in Karaganda Prov. of Kazakhstan. All records from Asteraceae are considered sitting records.

SPECIMENS EXAMINED: Lectotype of *Macrocoelus lepidus*: **RUSSIAN FEDERATION: Volgograd Prov.:** without locality label [Sarepta, Becker], 1♂, without USI label (MNHN). Lectotype of *Solenoxyphus parvulus*: Sarepta [Becker], 1♀, without USI label (MNHN). Paralectotypes of *Macrocoelus lepidus*: **FRANCE:** Balaruc, 2♂, 4♀, without USI label (MNHN).

Additional material: **ARMENIA:** Metsamor [former Kamarlu] Railway Station, 21 Aug 1931, Korinek, 1♂ (AMNH_PBI 00142093); 06 Aug 1931, Korinek, 2♀ (AMNH_PBI 00142075, AMNH_PBI 00142076); 07 Aug 1931, Korinek, 3♂ (AMNH_PBI 00142088–AMNH_PBI 00142090), 5♀ (AMNH_PBI 00142077, AMNH_PBI 00142104–AMNH_PBI 00142107); 12 Aug 1931, Korinek, 1♂ (AMNH_PBI 00142091), 1♀ (AMNH_PBI 00142108); 05 Aug 1931, Korinek, 1♂ (AMNH_PBI 00142092), 1♀ (AMNH_PBI 00142109); 31 May 1931, Korinek, 1♂

(AMNH_PBI 00142094); 17 May 1931, Korinek, 1 ♂ (AMNH_PBI 00142095); 24 May 1931, Korinek, 1 ♂ (AMNH_PBI 00142096); 15 Aug 1931, Korinek, 2 ♂ (AMNH_PBI 00142097, AMNH_PBI 00142098). **FRANCE:** Camargue, 8 Jul 1985, A. Carapezza, 1 ♂, without USI label (AC). **KAZAKHSTAN: Akmola Prov.:** At the confluence of the Dzhanama-Karas and Sarysu, 23 Jul 1903, Petrovskiy, 1 ♀ (AMNH_PBI 00141861). Eskeneyskie Mts, 15 Jul 1903, Petrovskiy, 1 ♂ (AMNH_PBI 00141848), 2 ♀ (AMNH_PBI 00141849, AMNH_PBI 00141850). **Almaty Prov.:** 30 km N Ala lake [Alakol], 21 Jul 1930, Lukyanovich, 1 ♂ (AMNH_PBI 00141988). 4 km S of Sarqant [Sarkand], 09 Jun 1957, I. M. Kerzhner, 1 ♀ (AMNH_PBI 00142206). Kenderlyk SW Zaysan lake, 13 Sep 1946, Kryzhanovskij, 1 ♀ (AMNH_PBI 00142324). Taldyqorqhan [Taldy-Kurgan] distr., 50 km W Mulaly, 15 Jul 1957, I. M. Kerzhner, 1 ♀ (AMNH_PBI 00142344). Zailiyskiy Alatau range, Dzhasyl-Kul, 15 Jul 1973, Kushakov, 1 ♀ (AMNH_PBI 00141993). Valley of B. Almaatinka River, Priyutskaya koloniya, 29 Aug 1928, Shnitnikov, 3 ♂ (AMNH_PBI 00142302–AMNH_PBI 00142304), 2 ♀ (AMNH_PBI 00142305, AMNH_PBI 00142306). **Atyrau Prov.:** Atyrau [Gur'ev], lower of Ural river, 31 Jul 1934, Rezvoy, 2 ♂ (AMNH_PBI 00142329, AMNH_PBI 00142330), 1 ♀ (AMNH_PBI 00142331). Imankara N lower of Emba River, 15 Jun 1932, Lukyanovich, 2 ♂ (AMNH_PBI 00142318, AMNH_PBI 00142319). **East Kazakhstan Prov.:** Arten-tau Mts W Kokpekty, Zaysan, 13 Jun 1930, Lukyanovich, 1 ♀ (AMNH_PBI 00141992). Burkhatka picket, Zaysan, Jun 1930, Lukyanovich, 1 ♀ (AMNH_PBI 00142321). Maqanchi nr Alakol lake, 24 Jul 1930, Lukyanovich, 1 ♀ (AMNH_PBI 00141991). Zaisan, Kokpekty, 09 Jun 1930, Lukyanovich, 2 ♂ (AMNH_PBI 00141862, AMNH_PBI 00141864), 12 ♀ (AMNH_PBI 00141871, AMNH_PBI 00141873, AMNH_PBI 00141876, AMNH_PBI 00141894–AMNH_PBI 00141895, AMNH_PBI 00141961–AMNH_PBI 00141967); 10 Jun 1930, Lukyanovich, 2 ♂ (AMNH_PBI 00141863, AMNH_PBI 00141889), 3 ♀ (AMNH_PBI 00141878, AMNH_PBI 00141891–AMNH_PBI 00141892); 11 Jun 1930, Lukyanovich, 8 ♂ (AMNH_PBI 00141881–AMNH_PBI 00141888), 9 ♀ (AMNH_PBI 00141865, AMNH_PBI 00141867–AMNH_PBI 00141870, AMNH_PBI 00141872, AMNH_PBI 00141875, AMNH_PBI 00141877, AMNH_PBI 00141879); 26 Jun 1930, Lukyanovich, 2 ♀ (AMNH_PBI 00141866, AMNH_PBI 00141874); 16 Jun 1930, Lukyanovich, 1 ♀ (AMNH_PBI 00141890); 14 Jun 1930, Lukyanovich, 1 ♀ (AMNH_PBI 00141893). **Karaganda Prov.:** 40 km S of Atasu [Zhana-Arka], 23 Jun 1960, I. M. Kerzhner, *Pyrethrum kasachstanicum*, 1 ♂ (AMNH_PBI 00142307), 2 ♀ (AMNH_PBI 00142312, AMNH_PBI 00142313); 18 Jul 1960, I. M. Kerzhner, 1 ♂ (AMNH_PBI 00142308). Karaganda Prov., 6 km W raz'ezd, 04 Jun 1961, Emeljanov, 1 ♂ (AMNH_PBI 00142349). **Kostanay Prov.:** 250 km S Kustanai, Ak-Suat Lake, 29 Jul 1946, Formozov, 1 ♂ (AMNH_PBI 00141974), 5 ♀ (AMNH_PBI 00141859–AMNH_PBI 00141860, AMNH_PBI 00141972–AMNH_PBI 00141973, AMNH_PBI 00141975); 15 Jul 1935–16 Jul 1935, Formozov, 1 ♂ (AMNH_PBI 00141969), 3 ♀ (AMNH_PBI 00141970–AMNH_PBI 00141971, AMNH_PBI 00141974); 25 Jun 1946, Formozov, 1 ♂ (AMNH_PBI 00141968), 1 ♀ (AMNH_PBI 00141976). Balykty Lake, 08 Sep 1931, Lukyanovich, 2 ♂ (AMNH_PBI 00141844, AMNH_PBI 00141845), 1 ♀ (AMNH_PBI 00141846). **North Kazakhstan Prov.:** Kokshetau, nr Tersakkan River, W Akmolinsk, 28 Jul 1957, Rudolf, 1 ♂ (AMNH_PBI 00142509). **Pavlodar Prov.:** Lebyazhye, Ust-Kamenogorsk, 19 Aug 1930, Lukyanovich, 1 ♀ (AMNH_PBI 00141990). **West Kazakhstan Prov.:** Dzhanibek st., 28 Jun 1961, I. M. Kerzhner, 2 ♂ (AMNH_PBI 00141978, AMNH_PBI 00141981), 3 ♀ (AMNH_PBI 00141982, AMNH_PBI 00141984–AMNH_PBI 00141985) *Salsola laricina*, 1 ♀ (AMNH_PBI 00141983); 26 Jun 1961, I. M. Kerzhner, 3 ♂ (AMNH_PBI 00141977, AMNH_PBI 00141979–AMNH_PBI 00141980), 2 ♀ (AMNH_PBI 00141986, AMNH_PBI 00141987); 03 Aug 2003, O. Hruleva, 16 ♂ (AMNH_PBI 00142019–AMNH_PBI 00142025, AMNH_PBI 00142039–AMNH_PBI 00142047), 16 ♀ (AMNH_PBI 00142031–AMNH_PBI 00142038, AMNH_PBI 00142052–AMNH_PBI 00142059); 06 Aug 2003, O. Hruleva, 25 ♂ (AMNH_PBI 00142048–AMNH_PBI 00142051, AMNH_PBI 00142064–AMNH_PBI 00142074, AMNH_PBI 00142078–AMNH_PBI 00142087), 4 ♀ (AMNH_PBI 00142060–AMNH_PBI 00142063). Yanvartsevo,

right bank of Ural River, 02 Sep 1949, A. N. Kiritshenko, 3♀ (AMNH_PBI 00142325, AMNH_PBI 00142327–AMNH_PBI 00142328); 09 Sep 1949, A. N. Kiritshenko, 1♀ (AMNH_PBI 00142326). **Zhambul Prov.:** Karasay St. N Shu [Chu], 16 Jul 1960, Emeljanov and Kerzhner, *Kochia prostrata*, 2♀ (AMNH_PBI 00142314, AMNH_PBI 00142315). Muyunkum Sands, Kargaly-kol' Lake, 22 May 1910, A. N. Kiritshenko, 20♂ (AMNH_PBI 00142214–AMNH_PBI 00142220, AMNH_PBI 00142234–AMNH_PBI 00142236, AMNH_PBI 00142238–AMNH_PBI 00142247), 8♀ (AMNH_PBI 00142221–AMNH_PBI 00142228); 15 May 1910, A. N. Kiritshenko, 19♂ (AMNH_PBI 00142248–AMNH_PBI 00142256, AMNH_PBI 00142260–AMNH_PBI 00142269), 17♀ (AMNH_PBI 00142230–AMNH_PBI 00142233, AMNH_PBI 00142273–AMNH_PBI 00142285); 21 May 1910, A. N. Kiritshenko, 1♂ (AMNH_PBI 00142237), 2♀ (AMNH_PBI 00142351, AMNH_PBI 00142352); 18 May 1910, A. N. Kiritshenko, 2♂ (AMNH_PBI 00142360, AMNH_PBI 00142361), 8♀ (AMNH_PBI 00142229, AMNH_PBI 00142357–AMNH_PBI 00142359, AMNH_PBI 00142362–AMNH_PBI 00142364, AMNH_PBI 00142374); 23 May 1910, A. N. Kiritshenko, 1♀ (AMNH_PBI 00142353); 24 May 1910, A. N. Kiritshenko, 2♀ (AMNH_PBI 00142354, AMNH_PBI 00142355); 25 May 1910, A. N. Kiritshenko, 1♀ (AMNH_PBI 00142356). **KIRGYZSTAN:** Karakol [Przhevalsk], Issyk-kol lake, 04 Sep 1942, Lubishev, 1♂ (AMNH_PBI 00142334), 2♀ (AMNH_PBI 00142332, AMNH_PBI 00142333). Nr Karakol [Przhevalsk], Toguz-Torau, 19 Aug 1928, V. Kuznetsov, 1♀ (AMNH_PBI 00142510). **MONGOLIA: East Govi Aimak:** 25 km E Shokhoy-nur, 03 Aug 1971, Emeljanov, 2♂ (AMNH_PBI 00141905), 1♀ (AMNH_PBI 00141905). **Govialtay Aimak:** W foothills of Ikhe-Bogdo, 19 Aug 1926, A. N. Kiritshenko, 1♂ (AMNH_PBI 00141998), 2♀ (AMNH_PBI 00142000, AMNH_PBI 00142001); 15 Aug 1926, A. N. Kiritshenko, 4♂ (AMNH_PBI 00141994–AMNH_PBI 00141997); 16 Aug 1926, A. N. Kiritshenko, 1♀ (AMNH_PBI 00142002). **RUSSIAN FEDERATION: Astrakhan Prov.:** 100 km SW Astrakhan, 15 Jul 1961, Emeljanov and Kerzhner, 1♂ (AMNH_PBI 00142202), 3♀ (AMNH_PBI 00142203–AMNH_PBI 00142205) *Kochia prostrata*, 1♀ (AMNH_PBI 00142167).

Baskunchak Lake nr Bolshoe Bogdo Mt., 07 Jun 1937–08 Jun 1937, Lukyanovich, 3♂ (AMNH_PBI 00142150–AMNH_PBI 00142151, AMNH_PBI 00142320); 08 Jul 1961, Emeljanov and Kerzhner, 1♂ (AMNH_PBI 00142169), 2♀ (AMNH_PBI 00142168, AMNH_PBI 00142170). El'ton Lake, 05 Jul 1961, Emeljanov and Kerzhner, *Camphorosma* sp., 2♂ (AMNH_PBI 00142154, AMNH_PBI 00142155), 2♀ (AMNH_PBI 00142152, AMNH_PBI 00142153). Tinaki, 28 Jul 1917, Doinikov, 1♀ (AMNH_PBI 00142508). **Belgorod Prov.:** Borisovka on Vorskla River, 23 Aug 1940, Korinek, *Kochia arenaria*, 11♂ (AMNH_PBI 00142100–AMNH_PBI 00142103, AMNH_PBI 00142143–AMNH_PBI 00142149), 43♀ (AMNH_PBI 00142099, AMNH_PBI 00142111–AMNH_PBI 00142126, AMNH_PBI 00142128–AMNH_PBI 00142142, AMNH_PBI 00142156–AMNH_PBI 00142166). **Buryatia Rep.:** SE Zabaikayle, Borgoy, coast of salt lake, 19 Jul 1928, Lukyanovich, 1♂ (AMNH_PBI 00141959). **Dagestan Rep.:** Budennovsk, 07 Jun 1935, Lyubishchev, 1♂ (AMNH_PBI 00141847). Buyanask [Temir-Khan-Shura], 22 Jun 1925, A. N. Kiritshenko, 3♀ (AMNH_PBI 00142335–AMNH_PBI 00142337). Kochubey [Chernuy Rynok] former Kyzlyar prov., 19 May 1925, A. N. Kiritshenko, 1♀ (AMNH_PBI 00141761). Malaya Areshevka, 01 Jun 1925, A. N. Kiritshenko, 1♂ (AMNH_PBI 00142316). **Khakassia Rep.:** Abakan, 11 Aug 1964, I. M. Kerzhner, *Kochia prostrata*, 6♂ (AMNH_PBI 00142208–AMNH_PBI 00142213), 2♀ (AMNH_PBI 00142200, AMNH_PBI 00142201). **Kursk Prov.:** Streletskaya Steppe, 04 Jul 1922, S. Medvedev, 1♀ (AMNH_PBI 00141880). **Orenburg Prov.:** Bazuluk Nature Reserve, 08 Jul 1941, Chostovskiy, 1♀ (AMNH_PBI 00142347). Elshanka, 60 km S Orenburg, 24 Jul 1933, L. Zimin, 2♀ (AMNH_PBI 00142300, AMNH_PBI 00142301). Left bank of Ural River, Verkhnedneprovka, 17 Jul 1934, L. Zimin, 2♂ (AMNH_PBI 00142296, AMNH_PBI 00142299), 1♀ (AMNH_PBI 00142292); 04 Jul 1934, L. Zimin, 1♂ (AMNH_PBI 00141921); 11 Aug 1934, L. Zimin, 5♂ (AMNH_PBI 00141919–AMNH_PBI 00141920, AMNH_PBI 00142293–AMNH_PBI 00142295), 7♀ (AMNH_PBI 00141909, AMNH_PBI 00141911, AMNH_PBI 00141922–AMNH_PBI 00141926); 18 Jul 1934, L. Zimin, 1♂ (AMNH_PBI 00141918), 2♀ (AMNH_PBI 00141930, AMNH_PBI 00141931); 21 Aug 1934,

- L. Zimin, 1 ♂ (AMNH_PBI 00141917); 28 Aug 1934, L. Zimin, 2 ♂ (AMNH_PBI 00141915, AMNH_PBI 00141916), 2 ♀ (AMNH_PBI 00141934, AMNH_PBI 00141935); 02 Jul 1934, L. Zimin, 4 ♀ (AMNH_PBI 00141910, AMNH_PBI 00141913–AMNH_PBI 00141914, AMNH_PBI 00142291); 12 Aug 1934, L. Zimin, 1 ♀ (AMNH_PBI 00141927); 17 Jul 1934, L. Zimin, 2 ♀ (AMNH_PBI 00141928, AMNH_PBI 00141929); 21 Jul 1932–27 Jul 1932, L. Zimin, 2 ♀ (AMNH_PBI 00141932, AMNH_PBI 00141933). Nr Orenburg, 06 Jun 1924, A.I. Ivanov, 1 ♂ (AMNH_PBI 00141960); 12 Sep 1924, A.I. Ivanov, 1 ♀ (AMNH_PBI 00142346). **Saratov Prov.:** Between rivers Bolshoy and Malyy Uzen, 07 Sep 1931, Lukyanovich, 4 ♂ (AMNH_PBI 00141851–AMNH_PBI 00141854), 4 ♀ (AMNH_PBI 00141855–AMNH_PBI 00141858). Dyakovka 25 km S Krasniy Kut, 22 Jun 1961, I. M. Kerzhner, 1 ♂ (AMNH_PBI 00141988). Lysaya Mt. nr Saratov, 28 Sep 1935, Lukyanovich, 1 ♀ (AMNH_PBI 00142127). Saratov, 25 Sep 1932, Lukyanovich, 1 ♂ (AMNH_PBI 00142323), 1 ♀ (AMNH_PBI 00142322). **Stavropol Terr.:** Manych, former ulus Bolshoy Derbet, 22 Jul 1914, B.P. Uvarov, 2 ♀ (AMNH_PBI 00142342, AMNH_PBI 00142343). **Tuva Rep.:** Erzín, 16 Aug 1964, I. M. Kerzhner, *Kochia prostrata*, 5 ♀ (AMNH_PBI 00142195–AMNH_PBI 00142199). Kyzyl, 13 Aug 1964, I. M. Kerzhner, *Kochia prostrata*, 15 ♂ (AMNH_PBI 00142171–AMNH_PBI 00142175, AMNH_PBI 00142182–AMNH_PBI 00142191), 8 ♀ (AMNH_PBI 00142176–AMNH_PBI 00142181, AMNH_PBI 00142193–AMNH_PBI 00142194). S slopes of E Tanu-Ola Mts., nr Samagaltai, H=1400–1800 m, 26 May – 15 Jun 2004, S.N. Vashchenko, 1 ♀, without USI label (AC). **Volgograd Prov.:** Krasnoarmeysk [former Sarepta], Becker, 2 ♂ (AMNH_PBI 00141938, AMNH_PBI 00141939), 4 ♀ (AMNH_PBI 00141940–AMNH_PBI 00141943); **Voronezh Prov.:** Savala forestry, Ternovka, 04 Aug 1953, Stark, 2 ♀ (AMNH_PBI 00142340, AMNH_PBI 00142341). **SPAIN:** **Catalonia:** Segrià: Albatàrres, 30 Aug 1975, J. Ribes, 1 ♂, without USI label (JR). Alfès, 4 Jun 1995, J. Ribes, 1 ♂, without USI label (JR). Lleida, 3 Nov 1963, J. Ribes, 1 ♀, without USI label (JR). **TURKMENISTAN:** Bala-Ishtem, 25 Jun 1989, Semenov, 1 ♂ (AMNH_PBI 00141764). **UKRAINE:** Askania-Nova Nature Reserve, 18 Sep 1930, Medvedev, 1 ♂ (AMNH_PBI 00141754), 1 ♀ (AMNH_PBI 00141759); 22 Sep 1930, Medvedev, 1 ♂ (AMNH_PBI 00141756); 27 Sep 1930, Medvedev, 1 ♂ (AMNH_PBI 00141755); 28 Sep 1930, Medvedev, 2 ♂ (AMNH_PBI 00141753, AMNH_PBI 00141757), 1 ♀ (AMNH_PBI 00141758). Donskaya balka, Viktorovka, 02 Jul 1922, A. N. Kiritshenko, 3 ♂ (AMNH_PBI 00141944, AMNH_PBI 00141951–AMNH_PBI 00141952), 12 ♀ (AMNH_PBI 00141945–AMNH_PBI 00141950, AMNH_PBI 00141953–AMNH_PBI 00141958). Odessa, Hadzhib, Liman, 15 May 1928, A. N. Kiritshenko, 1 ♀ (AMNH_PBI 00142427); 12 Aug 1920, A. N. Kiritshenko, 1 ♀ (AMNH_PBI 00142428). Odessa, Hadzhib, Liman, salt-marsh, 28 Sep 1922, A. N. Kiritshenko, 1 ♀ (AMNH_PBI 00142429). Odessa, Kuyalnitskiy Liman, 18 Sep 1920, A. N. Kiritshenko, 3 ♂ (AMNH_PBI 00137117–AMNH_PBI 00137119), 3 ♀ (AMNH_PBI 00137114–AMNH_PBI 00137116) (AMNH). 2 ♂ (AMNH_PBI 00142383, AMNH_PBI 00142384), 18 ♀ (AMNH_PBI 00142365–AMNH_PBI 00142382); 16 Sep 1920, A. N. Kiritshenko, 26 ♂ (AMNH_PBI 00142387–AMNH_PBI 00142400, AMNH_PBI 00142414–AMNH_PBI 00142425), 15 ♀ (AMNH_PBI 00142385–AMNH_PBI 00142386, AMNH_PBI 00142401–AMNH_PBI 00142413); 02 Aug 1920, A. N. Kiritshenko, 1 ♀ (AMNH_PBI 00142426). Odessa, Kuyalnitskiy liman, Hadzhib, 19 Jul 1920, A. N. Kiritshenko, 1 ♂ (AMNH_PBI 00142433), 1 ♀ (AMNH_PBI 00142432); 05 Jun 1922, A. N. Kiritshenko, 7 ♂ (AMNH_PBI 00142435–AMNH_PBI 00142441), 1 ♀ (AMNH_PBI 00142434). Odessa, Luzanovka, 02 May 1920, A. N. Kiritshenko, 1 ♂ (AMNH_PBI 00142431). Provalye, 01 Sep 1947, Medvedev, 1 ♀ (AMNH_PBI 00142507); 03 Sep 1947, Medvedev, 1 ♀ (AMNH_PBI 00142350). Snigirevka on Ingulets River, 19 Jul 1923, A. N. Kiritshenko, 2 ♀ (AMNH_PBI 00142338, AMNH_PBI 00142339). Stanitsa Luganskaya nr Lugansk, 25 Aug 1928, Galitskiy, 4 ♂ (AMNH_PBI 00142297–AMNH_PBI 00142298, AMNH_PBI 00142309–AMNH_PBI 00142310), 1 ♀ (AMNH_PBI 00142311). Veselyi Podol, 13 Jul 1951, Putshkov, 2 ♂ (AMNH_PBI 00142286, AMNH_PBI 00142430); 20 Jul 1951, Putshkov, 1 ♂ (AMNH_PBI 00142287), 4 ♀ (AMNH_PBI 00141724, AMNH_PBI 00142288–AMNH_PBI 00142290). **Crimea:** Agarmish Mt., A. N. Kiritshenko, 1 ♂ (AMNH_PBI 00141762). Kerch, V. Jakovlev coll., 1 ♂ (AMNH_PBI 00141765); 24

Jul 1908, A. N. Kiritshenko, 1 ♀ (AMNH_PBI 00141937); 01 Sep 1907, A. N. Kiritshenko, 1 ♂ (AMNH_PBI 00142317). Planerskoye [Koktebel], 28 Jul 1907, N. Pliginski, 1 ♂ (AMNH_PBI 00141760); 08 Jun 1904, A. N. Kiritshenko, 1 ♂ (AMNH_PBI 00141912), 1 ♀ (AMNH_PBI 00141936). Saki, 14 Aug 1910, N. Pliginski, 1 ♀ (AMNH_PBI 00141763). **UZBEKISTAN: Fergana Valley:** Gava, 05 Sep 1928–06 Sep 1928, V. Kuznetsov, 1 ♀ (AMNH_PBI 00142348). W Chust, Almas, 08 Sep 1928, V. Kuznetsov, 1 ♀ (AMNH_PBI 00142345).

Solenoxyphus loginovae (Putshkov, 1976),
new comb.

Figures 5, 61

Leucopteryx loginovae Putshkov, 1976: 1137–1138.

DIAGNOSIS: Distinguished by the comparatively large and irregularly distributed dots on forewings, faint dotting on hind femora, absence of dark setae on dorsum, and vesica with well-developed series of teeth extending proximally and distally to secondary gonopore. Close to *S. adpersum*, but differs in the pale tibial spines, long labium, and structure of the vesica. Somewhat resembles *S. pallens* but differs in the longer labium, irregular dotting on forewings, and absence of pale brown setae on clavus and corium.

DESCRIPTION: VESTITURE: Body covered only with silver setae, but cuneus in one specimen with distinctly infuscated setae.

COLORATION: Body (fig. 61) pale yellow, naturally greenish. Head, antennae, pronotum, and scutellum without any dark markings. Basal part of pronotum and apex of scutellum usually greenish. Forewings pale yellow; area along inner claval margins, exocorium (except very apex) and base of cuneus whitish. Whitish areas of forewings devoid of any dots, or covered with few minute and pale ones. Remainder of forewings irregularly covered with comparatively large, pale brown dots. Membrane milky hyaline, with slightly embrowned and indistinctly bordered area at middle. Legs pale; femora apically covered with pale brown dots. Dots sparse on fore- and middle femora, rather well marked on hind ones. Tibiae pale, with pale spines.

MALE GENITALIA: Vesica as in fig. 5, comparatively robust. Apical process long and acute, gradually becoming thinner, with distinctly curved apex, at least twice as long as width of vesica proximal to secondary gonopore. Longitudinal flange poorly developed. Series of teeth extending proximally and distally to secondary gonopore. Areas proximal to secondary gonopore and at extreme base of apical process covered with minute denticles.

STRUCTURE AND MEASUREMENTS: Labium long, extending far beyond hind coxae, reaching sixth or seventh abdominal segment. Hind femora not swollen in either sex. Females macropterous.

In males, body $3.4 \times$ as long as width of pronotum. Pronotum $2.3 \times$ as wide as long, $1.5 \times$ as wide as head. Vertex $1.3 \times$ as wide as eye. Second antennal segment $1.1 \times$ as long as basal width of pronotum, $1.6 \times$ as long as width of head. Body length: 4.2 mm.

In females, body $2.8\text{--}3.3 \times$ as long as width of pronotum. Pronotum $1.8\text{--}2.0 \times$ as wide as long, $1.3\text{--}1.5 \times$ as wide as head. Vertex $1.3\text{--}1.6 \times$ as wide as eye. Second antennal segment $0.9\text{--}1.0 \times$ as long as basal width of pronotum, $1.3 \times$ as long as width of head. Body length: $3.9\text{--}4.1$ mm.

DISTRIBUTION: Known only from the type locality—Repetek (Turkmenistan).

HOSTS AND NATURAL HISTORY: *Solenoxyphus loginovae* was originally collected and described by Putshkov (1976) from *Suaeda schrenkiana* (Chenopodiaceae, junior synonym of *Kochia odontoptera*). Kaplin (1993) provided some notes on the natural history of the species, based on long-term observations in the Repetek Nature Reserve. *Solenoxyphus loginovae* is a bivoltine species with summer-winter egg diapause and feeds on *Kochia odontoptera* as well as on *Londesia eriantha* (Chenopodiaceae). The first instar larvae of the first generation appeared in early April, during vegetative growth of both host plants. The second generation appeared in early May, at the period of flowering and fructification of host plants. The second generation adults were found in early June. The species was collected in an average quantity of 0.2–0.4 specimens per plant. A female lays up to 10 eggs.

SPECIMENS EXAMINED: Paratypes: **TURK-MENISTAN:** Repetek, 25 May 1976, Putshkov, 1♂, 1♀ (AMNH_PBI 00141184).

Additional material: Repetek, 02 Jun 1962, Trjapitzin, 1♂ (AMNH_PBI 00141181); 21 Jun 1972, Kaplin, *Haloxylon persicum*, 1♀ (AMNH_PBI 00141182); 24 Jun 1976, Kaplin, *Kochia odontoptera*, 2♀ (AMNH_PBI 00141183).

Solenoxyphus major Wagner, 1969

Figures 22, 23, 31, 68

Solenoxyphus major Wagner, 1969: 75–77,

DIAGNOSIS: Recognized by the dense and almost regular dotting on forewings, absence of dark setae on dorsum, pale tibial spines, and structure of the vesica. Externally similar to *S. kerzhneri* but differs in the strongly reduced longitudinal flange of the vesica and extension of a series of teeth proximally to secondary gonopore (compare figs. 20, 21, 30 and 22, 23, 31).

DESCRIPTION: VESTITURE: Composed of recumbent long, silver setae only.

COLORATION: Body pale yellow to greenish (fig. 68). Head and antennae uniformly pale, first antennal segment without dots. Pronotum without any dark markings in all specimens. Scutellum apically with several minute and indistinct pale brown dots, rarely uniformly pale. Whole forewings except membrane covered with dense, at times confluent brown dotting even laterally and at base. Diameter of dots on forewings about half the width of second antennal segment at base. Dotting on medioapical part of corium sometimes slightly darker than at extreme base. Base of cuneus usually with rather pale dots. Membrane smoky hyaline, with more or less embrowned, rarely transparent apical part. Cells wholly or apically embrowned, rarely milky but with narrow embrowned area along outer vein. Veins whitish or partly embrowned. Ventral surface pale. All femora with pale brown mottling on entire ventral surfaces except extreme bases. Dorsal surfaces of femora with identical mottling apically. Dots on femora of the same size or smaller and paler than those on forewings. Hind femora with minute dots of same color or

paler than those on forewings. Tibia with minute, but clearly visible dots at bases of pale tibial spines.

MALE GENITALIA: Vesica as in figs. 22, 23, 31. Apical process long, thin, and acute, with somewhat curved apex, distinctly longer than width of vesica proximal to secondary gonopore. Longitudinal flange prominent, forming gutterlike depression opposite to the main gutter of vesica-bearing ductus seminis. Series of teeth poorly developed, not extending proximal to secondary gonopore, half as long as gonopore or shorter.

STRUCTURE AND MEASUREMENTS: Labium always surpassing hind coxae, usually reaching fourth abdominal segment. Hind femora comparatively thin in males, somewhat swollen in females. Females macropterous.

In males, body 3.4–3.5 × as long as width of pronotum. Pronotum 1.9–2.0 × as wide as long, 1.2–1.3 × as wide as head. Vertex 1.2–1.3 × as wide as eye. Second antennal segment equal in length to basal width of pronotum, 1.2–1.3 × as long as width of head. Body length: 4.1–4.5 mm.

In females, body 2.8–3.0 × as long as width of pronotum. Pronotum 2.0 × as wide as long, 1.2–1.3 × as wide as head. Vertex 1.4 × as wide as eye. Second antennal segment 0.9–1.0 × as long as basal width of pronotum, 1.1–1.2 × as long as width of head. Body length: 3.7 mm.

DISTRIBUTION: This rare species is known only from Spain.

HOST PLANT: *Suaeda* sp. (Chenopodiaceae).

SPECIMENS EXAMINED: SPAIN: Catalonia: Alfes, Segria, 28 May 1995, J. Ribes, 4♂ (AMNH_PBI 00140664, AMNH_PBI 00140665) (JR); 04 Jun 1995, J. Ribes, 2♂ (AMNH_PBI 00140666), 2♀ (AMNH_PBI 00140667) (JR). Alpicat, Segria, 28 Jun 1971, Ribes, 1♀ (AMNH_PBI 00137138) (AMNH). **Zaragoza:** Bujalaroz, Laguna La Playa station, 09 Jun 1990, Ph. Magnien, J. Pericart & A. Matocq, *Suaeda* sp., 6♂ (AMNH_PBI 00140661, AMNH_PBI 00140662), 1♀ (AMNH_PBI 00140663). Bujalaroz, 15 Jul 1985, A. Carapezza, 1♀, without USI label (AC). Hostol Ciervo, 23 Jun 1989, Blasco, 1♂ (AMNH_PBI 00140669) (JR). Pina, 21 Jun 1990, Blasco, 1♂, without USI label (AC).

Solenoxyphus nanophyti (Vinokurov, 1995),
new comb.

Figures 2, 71, 72

Leucopteryx nanophyti Vinokurov in Vinokurov and
Kanyukova, 1995: 55–57.

DIAGNOSIS: Distinguished by the long, dark setae on dorsum, dotting on scutellum, subbrachypterous females and acute apical process of vesica. Similar to *S. asanovae* in body coloration, but differs in dimensions, ratios, length of labium, and structure of vesica (see diagnosis of *S. asanovae* for details).

DESCRIPTION: **VESTITURE:** Entire dorsal surface covered with contrastingly long, dark setae. Setae always adpressed on forewings, sometimes semierect on head and pronotum. Vertex, lateral sides of pronotum, base of scutellum, bases and sides of forewings also sparsely covered with silver curved setae. Ventral surface covered only with silver setae.

COLORATION: Body (figs. 71, 72) pale yellow, naturally greenish. Head and antennae uniformly pale. Pronotum, exposed part of mesoscutum, and scutellum regularly covered with minute brown dots. In the palest specimens, dotting on pronotum greatly reduced, only apical part of scutellum with pale dots. Clavus, corium, and cuneus also covered with brown dots, usually larger than those on pronotum. Medioapical area of clavus with dense and confluent dots; basally and laterally, dotting usually sparser and paler. Claval commissure usually embrowned. Corium with dense and sometimes confluent dotting apically, almost obsolete at base of wing. Dots on basal part of cuneus absent or discolored; cuneal dotting almost absent in the palest males and nearly all females. Membrane embrowned, with transparent rectangular area along lateral margin behind cells. Veins usually whitish. Ventral surface pale. In males, all femora embrowned along foremargins, hind femora thin. In females, femora usually pale, the darkest ones with indistinct brown stripe along foremargin of hind femora. In both sexes femora densely irrorated with brown dotting, in the palest females dots present only on hind femora. Tibial spines pale to pale brown. Tibiae pale.

MALE GENITALIA: Vesica as in fig. 2. Apical process long, thin, and acute, with somewhat curved apex, longer than width of vesica proximal to secondary gonopore. Longitudinal flange narrow, but distinctly sclerotized. Series of teeth not extending proximal or distal to secondary gonopore.

STRUCTURE AND MEASUREMENTS: Labium surpassing hind coxae. Hind femora slightly swollen. Females subbrachypterous, membrane slightly surpassing apex of cuneus.

In males, body $3.6\text{--}3.8 \times$ as long as width of pronotum. Pronotum $2.1\text{--}2.3 \times$ as wide as long, $1.2\text{--}1.3 \times$ as wide as head. Vertex $1.1\text{--}1.2 \times$ as wide as eye. Second antennal segment $0.95\text{--}1.0 \times$ as long as basal width of pronotum, $1.2\text{--}1.4 \times$ as long as width of head. Body length: 4.1–4.4 mm.

In females, body $2.7\text{--}2.8 \times$ as long as width of pronotum. Pronotum $2.0\text{--}2.2 \times$ as wide as long, $1.1\text{--}1.2 \times$ as wide as head. Vertex $1.3\text{--}1.4 \times$ as wide as eye. Second antennal segment $0.8\text{--}0.9 \times$ as long as basal width of pronotum, $0.9\text{--}1.0 \times$ as long as width of head. Body length: 2.8–3.0 mm.

NOTE: Two specimens from the type series (Hovd aimak, 5 km NW Uench, 25.VI.1980 [Kerzhner]) differ from the description given above. They are much darker, ground color embrowned, clypeus, mandibular and maxillary plates, and first antennal segment dark brown. Dotting on forewings much more regular than in specimens from Tuva. Head, pronotum and scutellum densely covered only with silver curved setae. Vesica with spinules at extreme apex of apical process. Female macropterous. Thus, the specimens from Mongolia are identified as *S. asanovae*, although they fit *S. nanophyti* in body length.

DISTRIBUTION: Known only from the type locality, Tuva Prov. (Russia).

HOST PLANT: *Nanophyton erinaceum* (Chenopodiaceae).

SPECIMENS EXAMINED: Holotype: **RUSSIAN FEDERATION: Tuva Rep.:** Kyzyl, 13 Aug 1964, I. M. Kerzhner, *Nanophyton erinaceum*, 1♂ (AMNH_PBI 00141308).

Paratypes: same label as holotype, 11♂ (AMNH_PBI 00141314–AMNH_PBI 00141315, AMNH_PBI 00141317–AMNH_PBI 00141319, AMNH_PBI 00141321–AMNH_PBI 00141322,

AMNH_PBI 00141324–AMNH_PBI 00141327), 9♀ (AMNH_PBI 00141328, AMNH_PBI 00141333–AMNH_PBI 00141334, AMNH_PBI 00141336, AMNH_PBI 00141339–AMNH_PBI 00141343), 1 larva (AMNH_PBI 00141309); 18 Jul 1964, I. M. Kerzhner, *Nanophyton erinaceum*, 3♂ (AMNH_PBI 00141316, AMNH_PBI 00141320, AMNH_PBI 00141323), 7♀ (AMNH_PBI 00141329–AMNH_PBI 00141332, AMNH_PBI 00141335, AMNH_PBI 00141337–AMNH_PBI 00141338).

Solenoxyphus pallens (Reuter, 1879),
new comb.

Figures 32, 33, 70

Leucopteryx(?) pallens Reuter, 1879: 262.

DIAGNOSIS: Close to *S. loginovae* and *S. halocnemi*, but differs from the former in much shorter labium, very regular dotting on forewings, and presence of pale brown setae on clavus and corium. *Solenoxyphus halocnemi* strongly resembles *S. pallens* in the previously mentioned characters, but it is much more robust. In *S. halocnemi* the vesica is comparatively robust, with a well-developed series of teeth running to base of apical process (figs. 6, 7). *Solenoxyphus pallens* has a smaller vesica with a series of teeth not extending distal to secondary gonopore (figs. 32, 33). Moreover, *S. halocnemi*, unlike *S. pallens*, has darker dotting on forewings.

DESCRIPTION: VESTITURE: On head, pronotum, and scutellum usually sparse, composed of pale brown and silver setae. Forewings covered with silver setae only at bases and laterally, while the whole coriaceous part of wing regularly covered with straight adpressed pale brown setae. In the palest and oldest specimens whole dorsal surface apparently covered with silver setae only, but pale brown setae recognizable on cuneus. Ventral surface covered only with silver setae.

COLORATION: Body (fig. 70) naturally greenish, usually pale yellow in dry specimens. Head, antennae, pronotum, and scutellum without any color pattern. Clavus, corium, and cuneus entirely yellow, regularly covered with minute pale brown dots. These dots usually somewhat depressed. Dotting on cuneus usually greatly reduced, distinct only

at extreme apex. In the palest specimens, only apex of corium with clearly visible dots. Membrane whitish hyaline or very slightly embrowned. Thorax and abdomen uniformly pale, without any markings. Femora pale or with faint pale brown dotting at apices. If present, this dotting more developed on ventral sides of femora. Tibiae pale; tibial spines whitish or slightly obfuscate.

MALE GENITALIA: Vesica as in figs. 31, 32. Apical process long, thin, and acute, with somewhat curved apex, longer than width of vesica proximal to secondary gonopore. Longitudinal flange not developed. Series of teeth not extending distal to secondary gonopore; area proximal to secondary gonopore with a series of minute denticles. Degree of dentation proximal to secondary gonopore somewhat variable.

STRUCTURE AND MEASUREMENTS: Labium reaching hind coxae. Hind femora comparatively thin in males, somewhat swollen in females. Females macropterous.

In males, body 3.1–3.4 × as long as width of pronotum. Pronotum 2.0–2.2 × as wide as long, 1.2–1.4 × as wide as head. Vertex 1.0–1.4 × as wide as eye. Second antennal segment 0.7–0.9 × as long as basal width of pronotum, 1.0–1.1 × as long as width of head. Body length: 3.3–4.4 mm.

In females, body 2.7–3.1 × as long as width of pronotum. Pronotum 2.0–2.2 × as wide as long, 1.2–1.3 × as wide as head. Vertex 1.4–1.7 × as wide as eye. Second antennal segment 0.6–0.7 × as long as basal width of pronotum, 0.8–0.9 × as long as width of head. Body length: 3.2–3.5 mm.

DISTRIBUTION: Azerbaijan, Russia (Astrakhan Prov.), European and Asian parts of Kazakhstan, Uzbekistan*, Tajikistan*, Iran (Wagner, 1957), and Mongolia*.

HOST PLANTS: *Anabasis aphylla*, *Anabasis salsa*, *Anabasis ramosissima*, three specimens from Kazakhstan were collected from *Anabasis ebracteolata* (Chenopodiaceae). Eight specimens from Ishkashim (Tajikistan) were collected from *Hammada wakhanica* (Chenopodiaceae). Single records from *Suaeda* sp. (Chenopodiaceae) in Karaganda Prov. and from *Salsola arbuscula* (Chenopodiaceae) in Zhambul Prov. of Kazakhstan are most probably sitting records.

SPECIMENS EXAMINED: Lectotype of *S. pallens*: **RUSSIAN FEDERATION: Astrakhan Prov.:** Orb. g. [= Orenburg Prov. in old borders, Mt. Bolshoe Bogdo], V. E. Jakovlev, 1 ♂ (AMNH_PBI 00140652).

Paralectotype of *S. pallens*: same label as lectotype, 1 ♀ (AMNH_PBI 00140678).

Additional material: **AZERBAIJAN:** Baku-Samaxi rd, 20 km W Baku, nr Maraz, 22 May 1972, Putshkov, 1 ♂ (AMNH_PBI 00141306), 1 ♀ (AMNH_PBI 00141306) *Anabasis aphylla*, 5 ♂ (AMNH_PBI 00141304, AMNH_PBI 00141305). **KAZAKHSTAN: Atyrau Prov.:** Saraychik, lower course of Ural River, 24 Jun 1952, Arnoldi, 1 ♂ (AMNH_PBI 00141284). **Karaganda Prov.:** 40 km S of Atasu [Zhana-Arka], 23 Jun 1960, I. M. Kerzhner, *Anabasis salsa*, 7 ♀ (AMNH_PBI 00141245, AMNH_PBI 00141251–AMNH_PBI 00141253, AMNH_PBI 00141255–AMNH_PBI 00141257); 21 Jun 1960, I. M. Kerzhner, *Suaeda* sp., 1 ♂ (AMNH_PBI 00141259); 22 Jun 1960, I. M. Kerzhner, *Anabasis salsa*, 2 ♀ (AMNH_PBI 00141254, AMNH_PBI 00141258). Koksengir N Dzhezkangan, 05 Jun 1961, Emeljanov, 1 ♀ (AMNH_PBI 00141279). **Kostanay Prov.:** 200 km SO Qyzylorda, nr Tyshkanbay [Akkum], 30 Jun 1966, I. M. Kerzhner, *Anabasis aphylla*, 2 ♂ (AMNH_PBI 00141274, AMNH_PBI 00141275). **Kyzylorda Prov.:** Turkistan town, 15 Jun 1904, V. Oshanin coll., 6 ♂ (AMNH_PBI 00140681–AMNH_PBI 00140686), 22 ♀ (AMNH_PBI 00141185–AMNH_PBI 00141206). **Mangistau Prov.:** Mangghyshlaq [Mangyshlak], Karchauk, Beke, 27 Jul 1955, Grunin, 1 ♀ (AMNH_PBI 00141276); 17 Sep 1955, Grunin, 1 ♂ (AMNH_PBI 00141277). S Usturt, chink Burchliburun, 05 Jun 1987, Mitroshina, *Anabasis ebracteolata*, 1 ♂ (AMNH_PBI 00141282), 2 ♀ (AMNH_PBI 00141282). **Zhambul Prov.:** Akzhar [Shapovalovka] nr Taraz [Aulie-Ata], 26 May 1910, A. N. Kiritschenko, 3 ♀ (AMNH_PBI 00141207–AMNH_PBI 00141208, AMNH_PBI 00141211); 27 May 1910, A. N. Kiritschenko, 2 ♀ (AMNH_PBI 00141209, AMNH_PBI 00141210). Karasay st N Shu [Chu], 16 Jul 1960, Emeljanov and Kerzhner, *Anabasis ramosissima*, 7 ♂ (AMNH_PBI 00141266–AMNH_PBI 00141269, AMNH_PBI 00141272, AMNH_PBI 00141272–AMNH_PBI 00141273). Shu [Chu] St., 13 Jul 1960, Emeljanov, 9 ♂ (AMNH_PBI 00141213, AMNH_PBI 00141216, AMNH_PBI 00141220–

AMNH_PBI 00141225, AMNH_PBI 00141227), 5 ♀ (AMNH_PBI 00141246–AMNH_PBI 00141250); 13 Jul 1960, Emeljanov and Kerzhner, 4 ♂ (AMNH_PBI 00140679–AMNH_PBI 00140680, AMNH_PBI 00141270–AMNH_PBI 00141271), 4 ♀ (AMNH_PBI 00141262–AMNH_PBI 00141265). W Bektak-Dala, Kendyrylyk, 11 Jun 1961, Emeljanov, *Salsola arbuscula*, 1 ♀ (AMNH_PBI 00141278). W Pribalhashye, 15 km S Mynaral, 19 Jun 1978, I. M. Kerzhner, 2 ♀ (AMNH_PBI 00141280) *Anabasis salsa*, 1 ♂ (AMNH_PBI 00141281), 1 ♀ (AMNH_PBI 00141281). **MONGOLIA: Bayanhongor Aimak:** Khalkha, from Unyugutentala to Kuku-Shande well, 30 Jun 1909, Kozlov, 1 ♂ (AMNH_PBI 00141307). **Govialtay Aimak:** 30 km WNW Bij-Altay [Bidzh Altay], 21 Jul 1970, Narchuk, 1 ♂ (AMNH_PBI 00141295), 3 ♀ (AMNH_PBI 00141294, AMNH_PBI 00141296). Tsaagan-Uul, 17 Jul 1969–18 Jul 1969, Egdon, 1 ♂ (AMNH_PBI 00141283). **Hovd Aimak:** 10 km N Uench, 28 Jul 1970, Emeljanov, 1 ♂ (AMNH_PBI 00141297). Bodonchin-Gol River, 12 km SW Altai, 22 Jul 1970, Emeljanov, *Anabasis aphylla*, 4 ♂ (AMNH_PBI 00141286, AMNH_PBI 00141287), 10 ♀ (AMNH_PBI 00141285, AMNH_PBI 00141288–AMNH_PBI 00141292); 22 Jul 1970, Narchuk, 1 ♂ (AMNH_PBI 00141293). **RUSSIAN FEDERATION: Astrakhan Prov.:** Baskunchak Lake nr Bolshoe Bogdo Mt., 07 Jul 1961, Emeljanov and Kerzhner, *Anabasis aphylla*, 10 ♂ (AMNH_PBI 00141214–AMNH_PBI 00141215, AMNH_PBI 00141217–AMNH_PBI 00141219, AMNH_PBI 00141226, AMNH_PBI 00141298–AMNH_PBI 00141301), 19 ♀ (AMNH_PBI 00141228–AMNH_PBI 00141244, AMNH_PBI 00141302–AMNH_PBI 00141303). **TAJIKI-STAN:** Pamir, Ishkashim, 20 Jul 1965, Narchuk, *Hammada wakhanica*, 6 ♂ (AMNH_PBI 00141311–AMNH_PBI 00141313), 2 ♀ (AMNH_PBI 00141313). **UZBEKISTAN:** Khiva, 14 May 1927, L. Zimin, 1 ♂ (AMNH_PBI 00141212).

Solenoxyphus punctipennis (Reuter, 1879)

Figures 12, 47, 73

Malthacosoma punctipenne Reuter, 1879: 254 (n. sp.).
Malthacosoma halimocnemis var. *impunctata* Wagner, 1958: 9.

DIAGNOSIS: Similar to *S. pallens*, *S. halocnemi* and *S. fuscovenosus* in regular and minute dotting of forewings but can be distinguished from the former two species by the absence of pale brown setae on clavus and corium. Distinguished from *S. fuscovenosus* by the color pattern of the membrane and the structure of apical process of vesica.

DESCRIPTION: **VESTITURE:** Composed of long and slightly curved adpressed silver setae.

COLORATION: Body (fig. 73) greenish to pale yellow. Head, antennae, pronotum, exposed part of mesoscutum and scutellum uniformly pale, without any color pattern. Entire forewing, except membrane, regularly and very densely covered with extremely small paler brown dots. Even in the palest specimens dotting always covering the entire wing. Size and density of dots equal throughout on clavus, corium, and cuneus. Diameter of dots on forewing not more than a third of basal width of second antennal segment. Membrane whitish hyaline, very gently embrowned apically. Veins whitish or yellowish. Ventral surface pale. Hind femora with pale brown roundish dots dispersed all along ventral surface, dots nearly twice as large as those on forewings. In the palest specimens, dotting on ventral surface reduced to a series of pale brown dots running along foremargin of femur. Dorsal surface of hind femur apically covered with several minute, and at times indistinct, pale brown dots. Middle femora with similar but reduced color pattern, rarely completely pale. Forefemora usually uniformly pale, sometimes with indistinct pale brown markings on ventral surface. Tibial spines brown; brown dots at bases of spines usually absent, rarely clearly distinct.

MALE GENITALIA: Vesica as in fig. 12, comparatively thin. Apical process long, thin, and acute, with somewhat curved apex, distinctly longer than width of vesica proximal to secondary gonopore. Longitudinal flange distinct but narrow. Series of teeth not extending proximal or distal to secondary gonopore.

STRUCTURE AND MEASUREMENTS: Labium at least slightly surpassing hind coxae, often reaching fourth abdominal segment. Hind femora not swollen in either sex, remarkably long and thin in males. Females macropterous. Tarsi as in fig. 47.

In males, body $3.0\text{--}3.6 \times$ as long as width of pronotum. Pronotum $2.0\text{--}2.2 \times$ as wide as long, $1.3\text{--}1.4 \times$ as wide as head. Vertex $1.3\text{--}1.5 \times$ as wide as eye. Second antennal segment $0.8 \times$ as long as basal width of pronotum, $1.1 \times$ as long as width of head. Body length: $3.1\text{--}3.6$ mm.

In females, body $3.1\text{--}3.2 \times$ as long as width of pronotum. Pronotum $2.1\text{--}2.2 \times$ as wide as long, $1.3 \times$ as wide as head. Vertex $1.5\text{--}1.7 \times$ as wide as eye. Second antennal segment $0.7\text{--}0.8 \times$ as long as basal width of pronotum, $0.9\text{--}1.0 \times$ as long as width of head. Body length: $3.6\text{--}3.8$ mm.

NOTE: *Malthacosoma halimocnemis* var. *impunctata* was described by Wagner (1958) from a large series of specimens collected from Iran that lacked brown dotting on forewings. Status of this variety needs further clarification.

DISTRIBUTION: Georgia, Azerbaijan, Armenia, Dagestan, Asian part of Kazakhstan, Turkmenistan, Iran, Uzbekistan, Kyrgyzstan, Tajikistan, Northwestern China*. Distribution of *S. punctipennis* in Mediterranean countries needs verification; see distribution of *S. adpersus* for details.

HOST PLANT: See *S. adpersus*.

SPECIMENS EXAMINED: Lectotype of *Malthacosoma punctipenne*: **KYRGYZSTAN:** Karakazuk [9 Jun 1871, A. Fedtschenko], 1♂ without USI label (ZMMU).

Additional material: **ARMENIA:** 3 km E of Areni, 26 Jul 1903, M. Kalashian, 1♂ (AMNH_PBI 00141706) (AC). 7 km NE Meghri, Artskavar gorge, 29 Jun 2003, M. Kalashian, 4♂ (AMNH_PBI 00141707) (AC), 5♀ (AMNH_PBI 00141719). Meghri on Araks River, 12 Jun 1925, Ryabov, 1♀ (AMNH_PBI 00141903). Metsamor [former Kamarlu] Railway Station, 11 Aug 1931, Korinek, 1♂ (AMNH_PBI 00141698), 2♀ (AMNH_PBI 00141696, AMNH_PBI 00141697); 19 Jul 1931, Korinek, 2♂ (AMNH_PBI 00141699, AMNH_PBI 00141700); 24 Jun 1931, Korinek, 1♀ (AMNH_PBI 00141683). Vedi nr Khosrov, 16 Jul 2002, M. Kalashian, 2♂ (AMNH_PBI 00141708), 1♀ (AMNH_PBI 00141720) (AC). **AZERBAIJAN:** 10 km from Yevlax [Evlakh], 18 Aug 1949, Bogachev, 1♂ (AMNH_PBI 00141908). Aramy, Mill'skaya Steppe, 07 Jun 1931, Zakhvatkin, 1♀ (AMNH_PBI 00141738).

Goytapa [Geok-Tapa], 04 Jul 1915, Bianchi, 1 ♀ (AMNH_PBI 00141725). Turut steppe, N of Yevlax [Evlakh], 28 May 1948, Bogachev, 90 ♂ (AMNH_PBI 00141154–AMNH_PBI 00141180, AMNH_PBI 00141389–AMNH_PBI 00141401, AMNH_PBI 00141415–AMNH_PBI 00141427, AMNH_PBI 00141434–AMNH_PBI 00141466, AMNH_PBI 00141479–AMNH_PBI 00141482), 49 ♀ (AMNH_PBI 00141142–AMNH_PBI 00141153, AMNH_PBI 00141402–AMNH_PBI 00141413, AMNH_PBI 00141428–AMNH_PBI 00141433, AMNH_PBI 00141467–AMNH_PBI 00141478, AMNH_PBI 00141493–AMNH_PBI 00141499). **Nakhichevan Prov.:** Darasham II Railway Station on Araks River, 25 Aug 1932, Ryabov, 1 ♂ (AMNH_PBI 00141906). Disar nr Ordubad, 20 Jul 1933, Znoiko, 1 ♀ (AMNH_PBI 00141739). Karadonlu on Araks River, 17 Jun 1911, P. Schmidt, 1 ♂ (AMNH_PBI 00141904). Ordubad, 09 Jun 1925, Ryabov, 1 ♀ (AMNH_PBI 00141736). Paraga NW of Ordubad, 26 Jun 1933, Znoiko, 1 ♂ (AMNH_PBI 00141737). **CHINA:** **Xinjiang Uygur Zizhiq:** Gobi, Saksau salt-marsh, between Nyursu and Dzhin-Dzhigo, 10 Aug 1898, Klements, 1 ♀ (AMNH_PBI 00141723). Turpan [Tuffal], 11 Sep 1898, Klements, 2 ♂ (AMNH_PBI 00141686, AMNH_PBI 00141687). **GEORGIA:** Tbilisi [former Tiflis], 10 Jul 1903–12 Jul 1903, K. Satunin, 58 ♂ (AMNH_PBI 00141483–AMNH_PBI 00141492, AMNH_PBI 00141506–AMNH_PBI 00141518, AMNH_PBI 00141532–AMNH_PBI 00141554, AMNH_PBI 00141562–AMNH_PBI 00141573), 28 ♀ (AMNH_PBI 00141500–AMNH_PBI 00141505, AMNH_PBI 00141519–AMNH_PBI 00141531, AMNH_PBI 00141555–AMNH_PBI 00141561, AMNH_PBI 00141584–AMNH_PBI 00141585); 09 Aug 1903, K. Satunin, 1 ♂ (AMNH_PBI 00141586); 13 Jul 1903–14 Jul 1903, K. Satunin, 2 ♀ (AMNH_PBI 00141587, AMNH_PBI 00141588); 28 Jul 1903–30 Jul 1903, K. Satunin, 1 ♀ (AMNH_PBI 00141589). **IRAN:** **Semnan:** Emamshachr [Shachrud], 28 May 1914, A. N. Kiritschenko, 1 ♂ (AMNH_PBI 00141682); 29 May 1914, A. N. Kiritschenko, 38 ♂ (AMNH_PBI 00141574–AMNH_PBI 00141583, AMNH_PBI 00141610–AMNH_PBI 00141617, AMNH_PBI 00141636–AMNH_PBI 00141648, AMNH_PBI 00141662–AMNH_PBI 00141668), 49 ♀ (AMNH_PBI 00141590–AMNH_PBI 00141609, AMNH_PBI 00141618–AMNH_PBI 00141635, AMNH_PBI 00141649–AMNH_PBI 00141659); 30 May 1914,

A. N. Kiritschenko, 6 ♂ (AMNH_PBI 00141675–AMNH_PBI 00141680), 8 ♀ (AMNH_PBI 00141688–AMNH_PBI 00141695); 05 Jun 1914, A. N. Kiritschenko, 3 ♂ (AMNH_PBI 00141088–AMNH_PBI 00141089, AMNH_PBI 00141669), 1 ♀ (AMNH_PBI 00141414); 06 Jun 1914, A. N. Kiritschenko, 8 ♂ (AMNH_PBI 00141660–AMNH_PBI 00141661, AMNH_PBI 00141670–AMNH_PBI 00141674, AMNH_PBI 00141681). **KAZAKHSTAN:** **Almaty Prov.:** Nr Almaty [former Vernyi], 1907, Shnitnikov, 1 ♂ (AMNH_PBI 00141734). **Karaganda Prov.:** Koksengir N of Dzhkazgan, 05 Jun 1961, Emeljanov, 1 ♀ (AMNH_PBI 00141749). **Kyzylorda Prov.:** Timur, 50 km of Turkistan, May 1903–Jul 1903, Klare, 1 ♂ (AMNH_PBI 00141899); Jun 1903–Sep 1903, Klare, 1 ♂ (AMNH_PBI 00141733), 1 ♀ (AMNH_PBI 00141898). **South Kazakhstan Prov.:** Alymtau Mt. W of Saryagach, 29 Jun 1925, Prinada, 1 ♀ (AMNH_PBI 00141900). **West Kazakhstan Prov.:** Khaki nr Urda, 03 Jul 1961, Emeljanov and Kerzhner, *Salsola foliosa*, 1 ♂ (AMNH_PBI 00141729), 3 ♀ (AMNH_PBI 00141743–AMNH_PBI 00141745). **Zhambul Prov.:** Merke nr Taraz [former Aulie-Ata], 16 Jun 1910, A. N. Kiritschenko, 1 ♂ (AMNH_PBI 00141735). **RUSSIAN FEDERATION:** **Dagestan Rep.:** Derbent, 19 Jun 1931, Ryabov, 1 ♂ (AMNH_PBI 00141685), 1 ♀ (AMNH_PBI 00141684). Makhachkala [former Petrovsk], 05 Jun 1925, A. N. Kiritschenko, 1 ♀ (AMNH_PBI 00141742). **TAJIKISTAN:** Ayyvadh, mouth of Kafirnigan River, 03 Aug 1934, Gussakovskiy, 1 ♀ (AMNH_PBI 00141750). Dushanbe [former Stalinabad], 17 Jul 1945, Gussakovskiy, 1 ♀ (AMNH_PBI 00141752). DzhiliKul' on Vakhsh River, 02 Sep 1935, Gussakovskiy, 1 ♀ (AMNH_PBI 00141902); 01 Sep 1935, Gussakovskiy, 1 ♀ (AMNH_PBI 00141901). Parkhar on Pyandzh River, 20 Jun 1934, Luppova, 1 ♀ (AMNH_PBI 00141748). Staraya Pristan' nr Dzhilikul', Vakhsh River, 21 Jul 1941, Gussakovskiy, 1 ♀ (AMNH_PBI 00141751). **TURKMENISTAN:** Ashgabat [Ashkhabad], 19 May 1932–23 May 1932, Ushinskiy, 1 ♀ (AMNH_PBI 00141718); Ahnger, 2 ♂ (AMNH_PBI 00141703, AMNH_PBI 00141704). Dzhebel, 17 Jun 1934, V. Popov, 1 ♂ (AMNH_PBI 00141705). Gokdepe [Geok-tepe], 12 Jun 1928, Semenov, 2 ♂ (AMNH_PBI 00141701, AMNH_PBI 00141702), 3 ♀ (AMNH_PBI

00141714-AMNH_PBI 00141716). Imambaba, Mary [Merv], 27 Apr 1912, Kozhanchikov, 2♂ (AMNH_PBI 00142013, AMNH_PBI 00142014), 3♀ (AMNH_PBI 00142026-AMNH_PBI 00142028); 23 Apr 1912, Kozhanchikov, 1♂ (AMNH_PBI 00142259). Kerki on Amu-Darya River, 27 May 1932, Marechek, 2♂ (AMNH_PBI 00142015, AMNH_PBI 00142016). Nr Garrygala [Kara-Kala], 13 Jul 1931, Chebotarevich, 1♀ (AMNH_PBI 00141717). **UZBEKISTAN: Fergana Valley:** Nr Divana, 16 Jul 1908, Zarudny, 1♀ (AMNH_PBI 00141731). Guliston [former Golodnaya Step], 31 May 1903, G. Jacobson, 1♂ (AMNH_PBI 00141749), 2♀ (AMNH_PBI 00141896, AMNH_PBI 00141897). Kamashi NE of Guzar, 05 Jul 1931, Gussakovskiy, 1♂ (AMNH_PBI 00142017); 25 Jul 1932, Gussakovskiy, 1♂ (AMNH_PBI 00142018), 1♀ (AMNH_PBI 00142029); 06 Jun 1932, Gussakovskiy, 1♀ (AMNH_PBI 00142030). Kanimekh NE of Bukhara, 18 Jul 1928, Burachek, 3♀ (AMNH_PBI 00141711-AMNH_PBI 00141713). Kitab, 29 Jul 1932, Gussakovskiy, 1♀ (AMNH_PBI 00141907). Old Bukhara, 25 May 1925, Rezvoy, Sokolov, 2♀ (AMNH_PBI 00141740, AMNH_PBI 00141741). Toshkent [Tashkent], 07 May 1912, Seslavina, 1♂ (AMNH_PBI 00141730), 1♀ (AMNH_PBI 00141747); 13 Jun 1913, A. N. Kiritshenko, 2♂ (AMNH_PBI 00141727, AMNH_PBI 00141728); 25 Jun 1912, Seslavina, 1♀ (AMNH_PBI 00141746). Yargak nr Khatyrchi, 13 Aug 1928, L. Zimin, 2♂ (AMNH_PBI 00141709, AMNH_PBI 00141710), 1♀ (AMNH_PBI 00141721); 16 Jul 1928, L. Zimin, 1♀ (AMNH_PBI 00141722).

Solenoxyphus salsolae, n. sp.

Figures 28, 34–39, 45, 69

DIAGNOSIS: This species is the nearest relative of *S. kerzhneri*. In general, males of *S. kerzhneri* are larger and almost parallel-sided, whereas males of *S. salsolae* are smaller and ovate. Both species are practically indistinguishable by external characters, but differ in the structure of the apical process of vesica.

DESCRIPTION: VESTITURE: Body densely covered with silver curved setae only.

COLORATION: Body (fig. 69) naturally greenish, whitish yellow in dry specimens. Head pale yellow, sometimes with green markings. Eyes pale brown to pale greenish.

Antennae uniformly whitish yellow. Pronotum and scutellum pale yellow or somewhat greenish, without any spots. Clavus, corium, and cuneus whitish; apices of exocorium and cuneus usually yellowish. Forewings with dense, irregular and sometimes confluent pale brown dotting almost obsolete at extreme base of wing. Dots on cuneus smaller than those on clavus and corium and more regularly distributed. Membrane smoky hyaline, usually slightly embrowned along veins. Ventral surface pale. Legs pale yellow; all femora with sparse pale brown dots obvious on ventral surface. Dorsal surface of hind femora often with a series of pale brown dots running from apex to hind margin. Dots on legs mainly equal in diameter to those on cuneus, but usually with a few larger ones. Tibiae with minute but always distinct pale brown dots at bases of tibial spines. Tibial spines pale. Tarsi with darkened apex of third tarsal segment and claws.

MALE GENITALIA: As in figs. 34–39. Apical process of vesica (figs. 37–39) long, with somewhat curved apex covered with minute teeth and not pointed, distinctly longer than width of vesica proximal to secondary gonopore. Longitudinal flange poorly developed. Series of teeth poorly developed, not extending proximal or distal to secondary gonopore.

STRUCTURE AND MEASUREMENTS: Body ovate. Head declivent, weakly projecting beyond eyes. Labium always surpassing hind coxae and usually reaching fourth abdominal segment. Hind femora somewhat swollen in both sexes. Tarsi thin (fig. 45), claw as in fig. 28. Females macropterous.

In males, body $2.8\text{--}3.2 \times$ as long as width of pronotum. Pronotum $2.0\text{--}2.1 \times$ as wide as long, $1.2\text{--}1.3 \times$ as wide as head. Vertex $1.2\text{--}1.3 \times$ as wide as eye. Second antennal segment $0.8\text{--}0.9 \times$ as long as basal width of pronotum, $1.1 \times$ as long as width of head. Body length: 3.4–4.0 mm.

In females, body $2.6\text{--}3.0 \times$ as long as width of pronotum. Pronotum $2.0\text{--}2.4 \times$ as wide as long, $1.3 \times$ as wide as head. Vertex $1.4\text{--}1.5 \times$ as wide as eye. Second antennal segment $0.6\text{--}0.8 \times$ as long as basal width of pronotum, $0.9\text{--}1.0 \times$ as long as width of head. Body length: 3.3–3.8 mm.

Distribution: Mongolia.

HOST PLANT: *Salsola passerina* (Chenopodiaceae).

ETYMOLOGY: The name *salsolae* refers to the host plant of the species.

SPECIMENS EXAMINED: Holotype: **MONGOLIA, South Hangay Aimak**, E coast of Tatsyn-Tsagan-nur Lake, 02 Aug 1969–04 Aug 1969, I. M. Kerzhner, *Salsola passerina*, ♂ (AMNH_PBI 00141768).

Paratypes: **MONGOLIA: East Govi Aimak:** 23 km WSW Bayan-Munh, 03 Jul 1971, Emeljanov, 6♂ (AMNH_PBI 00141824–AMNH_PBI 00141829), 13♀ (AMNH_PBI 00141813–AMNH_PBI 00141823); 03 Jul 1971, Medvedev, 3♂ (AMNH_PBI 00141830). 25 km E Shokhoy-nur, 03 Aug 1971, Emeljanov, 1♂ (AMNH_PBI 00141797). 28 km ENE Sain-Shand, 01 Jul 1971, I. M. Kerzhner, 1♂ (AMNH_PBI 00141808); 01 Jul 1971, Emeljanov, 3♂ (AMNH_PBI 00141809, AMNH_PBI 00141810), 2♀ (AMNH_PBI 00141811, AMNH_PBI 00141812). 5 km W Tenger-Nur Lake, 25 Jun 1971, I. M. Kerzhner, 3♂ (AMNH_PBI 00141807); 25 Jun 1971, Emeljanov, 13♂ (AMNH_PBI 00141792–AMNH_PBI 00141796), 4♂ (AMNH_PBI 00141788, AMNH_PBI 00141789) *Salsola passerina*, 2♂ (AMNH_PBI 00141790), 3♀ (AMNH_PBI 00141791). 50 km ENE Sain-Shand, 02 Jul 1971, Emeljanov, 8♂ (AMNH_PBI 00141777–AMNH_PBI 00141782), 7♀ (AMNH_PBI 00141783–AMNH_PBI 00141787). Bayan-Ulan Mt., 12 km NE Bain-Munh, 03 Jul 1971, Emeljanov, 10♂ (AMNH_PBI 00141384–AMNH_PBI 00141388, AMNH_PBI 00141833–AMNH_PBI 00141834), 3♀ (AMNH_PBI 00141831, AMNH_PBI 00141832). **Hovsgol Aimak:** Tsagan-Ula, 17 Jul 1969–18 Jul 1969, Eglon, 1♂ (AMNH_PBI 00141841). **South Govi Aimak:** 20 km W Bayan Dalay, 11 Aug 1967, Emeljanov, *Salsola passerina*, 1♂ (AMNH_PBI 00141380). 20 km WNW Bain Dalay, 31 Jul 1967, I. M. Kerzhner, 6♂ (AMNH_PBI 00141381–AMNH_PBI 00141383). 30 NNE Bulgan, 23 Jul 1967, I. M. Kerzhner, 1♀ (AMNH_PBI 00141376). 30 km NE Tsailan frontier post, 25 Aug 1969, I. M. Kerzhner, 2♂ (AMNH_PBI 00141373) *Salsola passerina*, 3♂ (AMNH_PBI 00141372), 1♀ (AMNH_PBI 00141374). 30 km SSE Tsogt-Obo, 11 Aug 1971, Emeljanov, 1♀ (AMNH_PBI 00141375). 40 km S Noen, 23 Aug 1969,

Kozlov, *Salsola passerina*, 4♂ (AMNH_PBI 00141378, AMNH_PBI 00141379), 5♀ (AMNH_PBI 00141377, AMNH_PBI 00141379). 60 km E Talyn Bilgeh Bulak spring, 17 Jul 1969–19 Jul 1969, Arnoldi, 2♂ (AMNH_PBI 00141363, AMNH_PBI 00141364); 17 Aug 1969–19 Aug 1969, Kozlov, 3♂ (AMNH_PBI 00141365), 1♀ (AMNH_PBI 00141365). 70 km S Noen, 23 Aug 1969–24 Aug 1969, I. M. Kerzhner, *Salsola passerina*, 4♂ (AMNH_PBI 00141366, AMNH_PBI 00141369); 23 Aug 1969–24 Aug 1969, Kozlov, *Salsola passerina*, 7♂ (AMNH_PBI 00141367–AMNH_PBI 00141368, AMNH_PBI 00141371); 23 Aug 1969–24 Aug 1969, Arnoldi, 2♂ (AMNH_PBI 00141370). Dzemgin-Gobi, 25 km SSW Haylastyn-Huduk, 20 Jun 1971, Emeljanov and Kozlov, 12♂ (AMNH_PBI 00141798–AMNH_PBI 00141803) *Salsola passerina*, 2♂ (AMNH_PBI 00141804). Hushu-Sair, 25 km SW Hailastyn-Huduk, 21 Jun 1971, I. M. Kerzhner, 1♂ (AMNH_PBI 00141806). Sair Undyn-Gol, 25 km S Han-Bogdo Mt., 23 Jun 1971, I. M. Kerzhner, 1♂ (AMNH_PBI 00141805). **South Hangay Aimak:** same label as holotype, 17♂ (AMNH_PBI 00141769–AMNH_PBI 00141776). **Suhbaatar Aimak:** 7 km W Hongor, 04 Jul 1971, I. M. Kerzhner, *Salsola passerina*, 2♂ (AMNH_PBI 00141837, AMNH_PBI 00141838), 1♀ (AMNH_PBI 00141839). Galyn-Nur Lake, 40 km SE Hongor, 07 Jul 1971, Emeljanov, 2♀ (AMNH_PBI 00141835, AMNH_PBI 00141836). Ongon-Els Sands, 15 km SSE Hongor, 05 Jul 1971–06 Jul 1971, Emeljanov, 1♂ (AMNH_PBI 00141840).

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