

NEW AND LITTLE-KNOWN SPECIES OF SCYTHRIDID MOTHS
COLLECTED BY Z. KASZAB IN MONGOLIA (LEPIDOPTERA:
GELECHIOIDEA, SCYTHRIDIDAE)*

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We examined the scythruid specimens collected in Mongolia by Dr. Z. KASZAB during his six expeditions between 1963 and 1968, now preserved in the Hungarian Natural History Museum (Budapest, Hungary). Seven new species are described, namely *Scythruid kaszabi* sp. n., *S. mongholica* sp. n., *S. bajaranlegi* sp. n., *S. talyniella* sp. n., *S. gobiensis* sp. n., *S. sachkovi* sp. n. and *S. pallidella* sp. n.; new records of some little-known species from Mongolia are added and the female of *S. cirra* FALKOVITCH, 1972 is described for the first time.

Key words: Scythruididae, Mongolia, new species, faunistics

INTRODUCTION

The Scythruididae fauna of Mongolia is poorly known. Although many new species have recently been added to the family, only eight of them were collected in Mongolia and relatively few records have been reported thus far (Fig. 1).

Many valuable data of the Mongolian fauna were obtained from the six expeditions of the late Dr. Z. KASZAB (1915–1986) organized by the Mongolian and the Hungarian Academies of Sciences between 1963 and 1968 to gather information on the terrestrial fauna in arid and semiarid zones of Mongolia. Overwhelming majority of the KASZAB material has already been examined and more than 500 papers dealing with various groups have been published (e.g. ANDRÁSSY 1977, FALKOVITCH 1972*b* 1974, 1975, KASZAB 1977, KUHLMANN & DORN 2002, MANNHEIMS & SAVCHENKO 1967, 1973, PAPP 2004*a, b*; RAUSER 1968, RIEDL 1967, ROHDENDORF & VERVES 1978, RÜCKER 1983, VOJNITS 1976, VOSS 1967). However, our knowledge on the Mongolian Lepidoptera fauna is still poor, as previously noted by PEREGOVITS (1989).

To increase our knowledge of the eastern Palaearctic fauna, we studied the KASZAB collection from Mongolia, now preserved in the Hungarian Natural History Museum, Budapest. Studies of the Mongolian fauna are very important because the peculiar position of the country and its geographical characteristics (ex-

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treme continental climate, orographic and edaphic conditions, and strong climatic fluctuations during the Pleistocene) have greatly affected the current fauna (VARGA *et al.* 1989).

MATERIALS AND METHODS

Based on an agreement between the Mongolian Academy of Sciences and its Hungarian counterpart, Z. KASZAB made six expeditions in Mongolia from 1963 to 1968, each time following a different route in order to collect material throughout the country (Fig. 2). After each journey, KASZAB published a detailed account of the places he visited, with notes on geography, climate and flora (KASZAB 1964–1969). KASZAB's diaries of his Mongolian expeditions provide information on the various types of vegetation, the climatic regimes and the collection methods; hence, they are useful for comparisons with the scythruid specimen labels and also to precisely locate the collection sites.

We examined the KASZAB material from Mongolia, obtaining information on the collection localities from his reports. We then studied the Scythruidae distribution in Mongolia and surrounding areas, collecting data on general features of the areas, such as vegetation and climate. Information on the vegetation of Mongolia was mainly provided by HILBIG (1995), without whom most of the

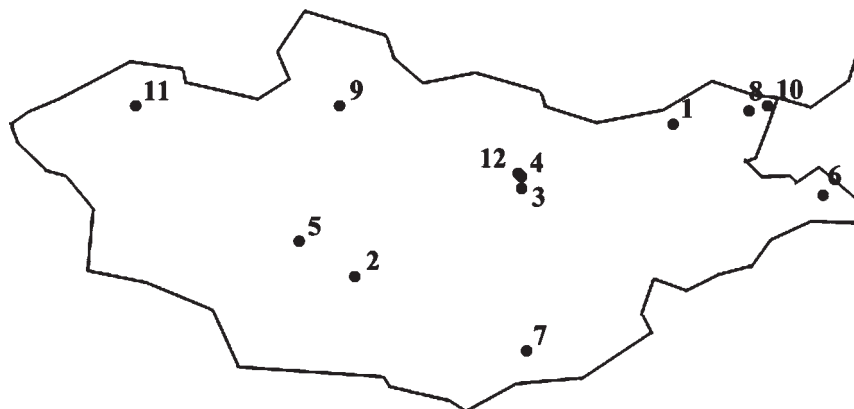


Fig. 1. Map of the scythruid collection localities. 1 = Bayan Ula, 20 km ESE, Dornod aimag; 2 = Bogd Ula, Bayanhongor aimag; 3 = Bogdo Ula, Saisan Tolgain Valley, Ulaanbaatar Hot; 4 = Bogdo-Ula Mt., northern slope, Ulaanbaatar Hot; 5 = Darkhan-Tsagaan Ovoo, 60 km ESE of Bayanburd, Bayanhogor aimag; 6 = Khalkh gol, 33 km S, Khalkhyn Gol, Dornod aimag; 7 = Khan-Bogdo, 8 km NNE, Omnogovi; 8 = Khökh Nuur, Dornod aimag; 9 = Mörön, Hövsgöl aimag; 10 = Numurgin Gol, 32 km SE from Sal'khit Mt., Dornod aimag; 11 = Togtohd'n Shil, 50 km ESE Ulaan Goom, Uvs aimag; 12 = Ulaanbaatar. Until now, eight *Scythr*is species were found in Mongolia: *S. bengtssoni* PATOČKA *et* LIŠKA, 1989 (6); *S. felixi* BENGTTSSON *et* SUTTER, 1996 (9); *S. Iovovskiyi* SINEV, 2001 (12); *S. macrourella* SINEV, 2001 (1, 3, 10); *S. minorella* SINEV, 2001 (2, 6, 11); *S. nitidella* BENGTTSSON *et* LIŠKA, 1996 (5); *S. orientella* SINEV, 2001 (6, 8); and *S. sinevi* NUPPONEN, 2003 (7, 4). (The collection sites for each species are in parentheses)

data in Russian (GUBANOV 1996, GRUBOV 1982, GRUBOV & JUNATOV 1952) would have been unavailable to us.

Since the close relationship among various zones of Eastern Palaearctic has been demonstrated many times for numerous taxa (EBMER 1982, HARIS 2002, HOLZEL 1980, HREBLAY 1990, KRISTOFIK 1999, MINAR 1976, MYAGMARSUREN 1982, PFEIFFER *et al.* 2003, TOLKANITS 2001, VERVES 1982), knowledge of the geographical features of these areas can lead to a better understanding of scythruid distribution.

We reviewed the distribution data of scythruides from Mongolia and surrounding areas based on literature (BENGTSSON 1997*a, b*; BENGTSSON & LIŠKA 1996, BENGTSSON & SUTTER 1996, FALKOVITCH 1969, 1972*a*, 1979, 1981, 1986, NUPPONEN 2003, NUPPONEN & NUPPONEN 2001, NUPPONEN *et al.* 2000, PASSERIN D'ENTRÈVES & ROGGERO 2004, 2005, Patočka & LIŠKA 1989, SACHKOV 1995, 2000, 2002, SACHKOV & SINEV 2001, SINEV 1993, 2001*a*), and on specimens from several collections.

To study the scythruid distribution in Mongolia, we georeferenced each collection locality and used the coordinates to create digital maps in GIS environment by means of MapInfo 6.0 (MapInfo Corporation, 1985–2000).

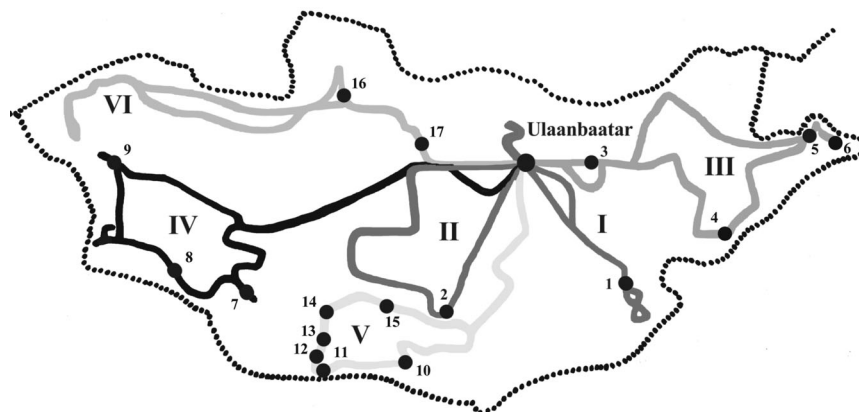


Fig. 2. Routes of KASZAB's six expeditions in Mongolia (from KASZAB 1969, modified). I. 15th June–16th July 1963. The first expedition from Ulaanbaatar reached the southern part of the Gobi Desert to the Chinese border and the northern part to Zuun-Chara (KASZAB 1964); II. 10th June–13th July 1964. The second expedition covered the area of the Altay Gobi, the Great Lakes Basin between the Altay Gobi and the Hangay Range, and the ESE region to the Hangay Range (KASZAB 1965); III. 21st July–2nd September 1965. KASZAB organized the third expedition in the eastern Mongolian steppes (KASZAB 1966); IV. 1st June–31st July 1966. The fourth expedition covered the far western regions of Mongolia, through the Hangay Range, the Gobi Altay, Aj Bogd Uul, the Dzungarian Gobi, the Mongol Altay and the Hangay Range again (KASZAB 1967); V. 24th May–30th July 1967. In the fifth expedition Kaszab covered the remote mountainous regions and the stagnant basins of the Transaltay Gobi (KASZAB 1968). VI. 30th May–2nd August 1968. The sixth and last expedition covered the northern and northwestern regions of Mongolia, where woods and high mountainous steppe can be found, as well as the desert depressions of the Great Lakes Basin, reaching the Tolbo Nuur (KASZAB 1969). The localities where the scythruides were found are numbered in succession by date (see Appendix for further references)

RESULTS

After a careful examination of the material collected by KASZAB in Mongolia, we identified only 66 scythridid specimens, corresponding to about 0.16% of the total sample of over 41000 Lepidoptera. Only one scythridid specimen was collected during the first expedition in the sandy region of the Gobi desert (1963) as in the three-week expedition to Altay Gobi in 1964. The following year, four scythridid specimens were collected in Eastern Mongolia steppes. In his fourth expedi-

Table 1. List of the collection localities

No.	Locality	Altitude (m)	Date	Exp.
1	Omnogobi aymag, Cagan Elis, 30 km ESE of Zuun-Bajal	800	22.VI.1963	I
2	Omnogobi aymag, 25 km N of somon Bulgan, Schovongin chooloi	1030	18.VI.1964	II
3	Hentiy aymag, SW somon Zanchermandal and somon Zargaltchaan	1400	27.VII.1965	III
4	Suhbaatar aymag, Moltsog Els, 2 km S of somon Ovoot	1150	6.VIII.1965	III
5	Choybalsan aymag, SW shore of the Bujir Nuur	585	11.VIII.1965	III
6	Choybalsan aymag, Halhyn gol river, Chamardavaa Uul, 80 km S of somon Halhyn gol	600	12.VIII.1965	III
7	Gobi Altay aymag, Zachuj Gobi, 10 km N of Chatan chajrchan Range	1150	27.VI.1966	IV
8	Gobi Altay aymag, about 5 km S of the Pass between Aj Bogd Uul and Tachijin Schar Nuruu Range	1600	29.VI.1966	IV
9	Gobi Altay aymag, Chasat chajrchan Uul Range, about 20 km S of somon Zargalan	2400	15.VII.1966	IV
10	Omnogobi aymag, 100 km W of the Ovot Chuurai Checkpoint	1250	22.VI.1967	V
11	Bayanhongor aymag, the spring of Talyn, Bilgech bulag, 47 km E of the Caganbulag Checkpoint	1200	23.VI.1967	V
12	Bayanhongor aymag, Cagan Bogd Uul, Tooroin bulag 13 km E of the Caganbulag Checkpoint	1500	24.VI.1967	V
13	Bayanhongor aymag, Ehiyn-gol oasis, 90 km NE of the Caganbulag Checkpoint	950	28.VI.1967	V
14	Bayanhongor aymag, Dzuur-mod oasis, 100 km S of somon Schine žinst	1300	29.VI.1967	V
15	Ovorhangay aymag, 130 km ESE of somon Bajanleg	1150	3.VII.1967	V
16	Bulgan aymag, 20 km NW of somon Chanžargalant	1350	16.VI.1968 22.VII.1968	VI
17	Hövsgöl aymag, 4 km NW of the town of Mörön	1500	18.VII.1968	VI

tion (1966), KASZAB collected 14 scythruid specimens while only four were collected during the last journey (1968). The 42 scythruid specimens collected during the fifth journey in Transaltay Gobi (1967) represent the richest sample of scythruids found by KASZAB in Mongolia (Table 1).

Hereafter, we describe seven new species of Scythruidae and report many new records from Mongolia. Some females remain undetermined and are not reported here, since we could not determine whether they represent new species or belong to species whose male is already known.

Scythis kaszabi sp. n.

(Fig. 3)

Holotype. ♂ MONGOLIA: Gobi Altaj aimak, cca 5 km S vom Pass, zwischen Až Bogd ul und Tachijin Schar nuruu Gebirge, 1600 m Exp. Dr. Z. KASZAB, 1966 / Nr. 601 29.VI.1966 / Prep. Gen. N. Passerin d'E. / 4118 ♂ / Genital slide no. 4118 Passerin d'Entrèves / Holotypus *Scythis kaszabi* n. sp. P.E. & R.

Paratypes. 1 ♀ MONGOLIA: Gobi Altaj aimak, cca 5 Km S vom Pass, zwischen Až Bogd ul und Tachijin Schar nuruu Gebirge, 1600 m Exp. Dr. Z. KASZAB, 1966 / Nr. 601 29.VI.1966 / print: Prep. Gen. N. Passerin d'E. / 4071 ♀ / Genital slide no. 4071 Passerin d'Entrèves; 1 ♂ MONGOLIA: Gobi Altaj aimak, cca 5 km S vom Pass, zwischen Až Bogd ul und Tachijin Schar nuruu Gebirge, 1600 m Exp. Dr. Z. KASZAB, 1966 / Nr. 601 29.VI.1966 / Prep. Gen. N. Passerin d'E. / 4072 ♂ / Genital slide no. 4072 Passerin d'Entrèves.; 3 ♂♂ MONGOLIA: Gobi Altaj aimak, cca 5 km S vom Pass, zwischen Až Bogd ul und Tachijin Schar nuruu Gebirge, 1600 m Exp. Dr. Z. KASZAB, 1966 / Nr. 601 29.VI.1966.

Other material. 3 specimens, without abdomen, MONGOLIA: Gobi Altaj aimak, cca 5 km S vom Pass, zwischen Až Bogd ul und Tachijin Schar nuruu Gebirge, 1600 m Exp. Dr. Z. KASZAB, 1966 / Nr. 601 29.VI.1966.

Description – Male. Wingspan 18 mm. Fore wings dark brown patterned in white, with three whitish, irregular dots along a median line from base to apex of the wings. Long and light brown fringe. Hind wings whitish, glossy, with darker apex. Fringe light brown, darker near the apex of wing. Head, thorax and abdomen brown, the segments of abdomen with a whitish fascia. Anal turf light brown. Legs very light brown. Antennae brown, as long as the fore wings.

Female. Wingspan 18 mm. Fore wings brown and white spotted, with three dots shaped as in the male. Brownish fringe. Hind wings white, glossy, with a very light brown fringe. Head, thorax and abdomen as in the male. Legs light brown. Antennae brown, as long as the fore wings.

Male genitalia (Figs 3A, B & C). Uncus U-shaped, with the apices converging and hooked, with a squared base; gnathos median process elongate, down-arched and sharp; tegumen subtrapezoidal. Valvae symmetrical, arched, sharp on apex, with a lamina lightly sclerotized on the internal edge from base to apex. Aedeagus down-turned, half as long as the valvae. T8 superior edge curved, S8 is largely hexagonal, with a small incision posteriorly.

Female genitalia (Fig. 3D). Sterigma posteriorly with a large well-sclerotized process, concave at apex, bearing internally the sclerotized ductus bursae.

Distribution. Known only from Mongolia.

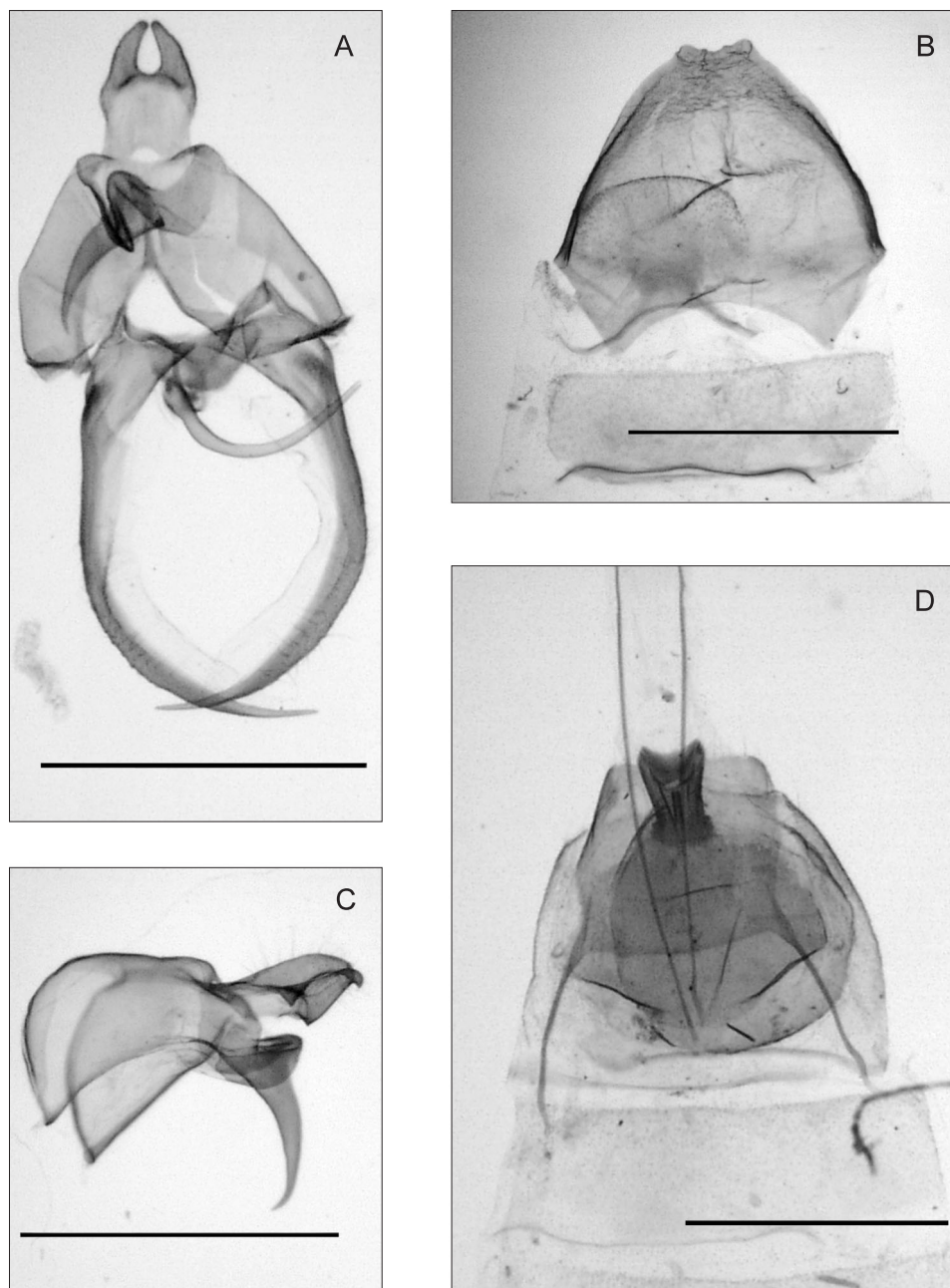


Fig. 3. Genitalia of *S. kaszabi* sp. n. Male: A = uncus-tegumen-gnathos-aedeagus-valvae complex; B = T8 and S8; C = uncus and gnathos, lateral view. Female = D. Scale bar = 1 mm

Biology. The species was collected in southern Mongolia at the end of June, near an oasis surrounded by poplars.

Remarks. *S. kaszabi* sp. n. is not related to any known species-group.

Etymology. The species is named after the late Hungarian entomologist Z. KASZAB, who collected the scythruid material in Mongolia in the years 1963–1968.

***Scythis mongholica* sp. n.**

(Fig. 4)

Holotype. ♂ MONGOLIA: Uburchangaj aimak 130 km OSO von Somon Bajanleg, 1150 m Exp. Dr. Z. KASZAB, 1967 / Nr. 882 3.VII.1967 / Prep. Gen. N. Passerin d'E. / 4111 ♂ / Genital slide no. 4111 Passerin d'Entrèves / Holotypus *Scythis mongholica* P.E. & R.

Paratypes. 1 ♂ MONGOLIA: Uburchangaj aimak 130 km OSO von Somon Bajanleg, 1150 m Exp. Dr. Z. KASZAB, 1967 / Nr. 882 3.VII.1967 / Prep. Gen. N. Passerin d'E. / 4100 ♂ / Genital slide no. 4100 Passerin d'Entrèves; 1 ♂ MONGOLIA: Uburchangaj aimak 130 km OSO von Somon Bajanleg, 1150 m Exp. Dr. Z. KASZAB, 1967 / Nr. 882 3.VII.1967 / Prep. Gen. N. Passerin d'E., 4110 ♂ / Genital slide no. 4110 Passerin d'Entrèves; 1 ♂ MONGOLIA: Uburchangaj aimak 130 km OSO von Somon Bajanleg, 1150 m Exp. Dr. Z. KASZAB, 1967 / Nr. 882 3.VII.1967 / 9370 ♂ / Genital slide no. 9370 Passerin d'Entrèves; 1 ♂ MONGOLIA: Uburchangaj aimak 130 km OSO von Somon Bajanleg, 1150 m Exp. Dr. Z. KASZAB, 1967 / Nr. 882 3.VII.1967 / 9371 ♂ / Genital slide no. 9371 Passerin d'Entrèves.

Description – Male. Wingspan 10 mm. Fore wings and hind wings whitish and glossy, with light brown dots on the whole surface. Fringes light tawny. Head, thorax and abdomen very light brown. Legs whitish. Antennae light brown, as long as the fore wings.

Female. Unknown.

Male genitalia (Fig. 4 A, B, and C). Uncus laminar, elongate, Y-shaped, with a very long basal branch and two well-sclerotized, paired protuberances at base. Gnathos well developed, very enlarged at base, narrowing abruptly toward apex, down-turned at two thirds of the length and sharp. Tegumen conical with dorso- and ventroanterior incisions, as long as the uncus; valvae symmetrical, arched and narrow at apex, bearing setae in distal half. Aedeagus bifid at apex, curved, as long as uncus. T8 triangular and elongate, S8 triangular, narrow and long, apex rounded and slightly protruding.

Female genitalia. Unknown.

Distribution. Known only from Mongolia.

Biology. The specimens were collected in southern Mongolia at the beginning of July, near a dry salt basin.

Remarks. Although the female of *S. mongholica* sp. n. is unknown, the species is surely related to *S. ammobia* FALKOVITCH, *S. asema* FALKOVITCH, *S. asthenana* FALKOVITCH, *S. hypolepta* FALKOVITCH and *S. physalis* FALKOVITCH, on the basis of the genitalia features. These species are known only from Eastern Palaearctic region. *S. mongholica* and *S. ammobia* FALKOVITCH are sister-species and

can be distinguished by many diagnostic characters. The superior edge of uncus is four-lobate in *S. ammobia*, and U-shaped in *S. mongholica*. The features of the base of uncus are very different in the two species: enlarged and bearing a sclerotized structure narrowed in the middle in *S. mongholica*, rectilinear on the sides with an up-curved sclerotized structure in *S. ammobia*. Gnathos, tegumen and aedeagus are very similar in shape in both the species. The valvae are far more arched and enlarged in the proximal half in *S. ammobia* than in *S. mongholica*, and the apex is more rounded and enlarged in the former species than in the latter one. Furthermore, the setae are short on the inner edge and long on the outer edge in *S. mongholica*, but long on the inner edge and short on the outer one in *S. ammobia*.

Etymology. The species is named after the state of Mongolia, where it was collected for the first time by KASZAB.

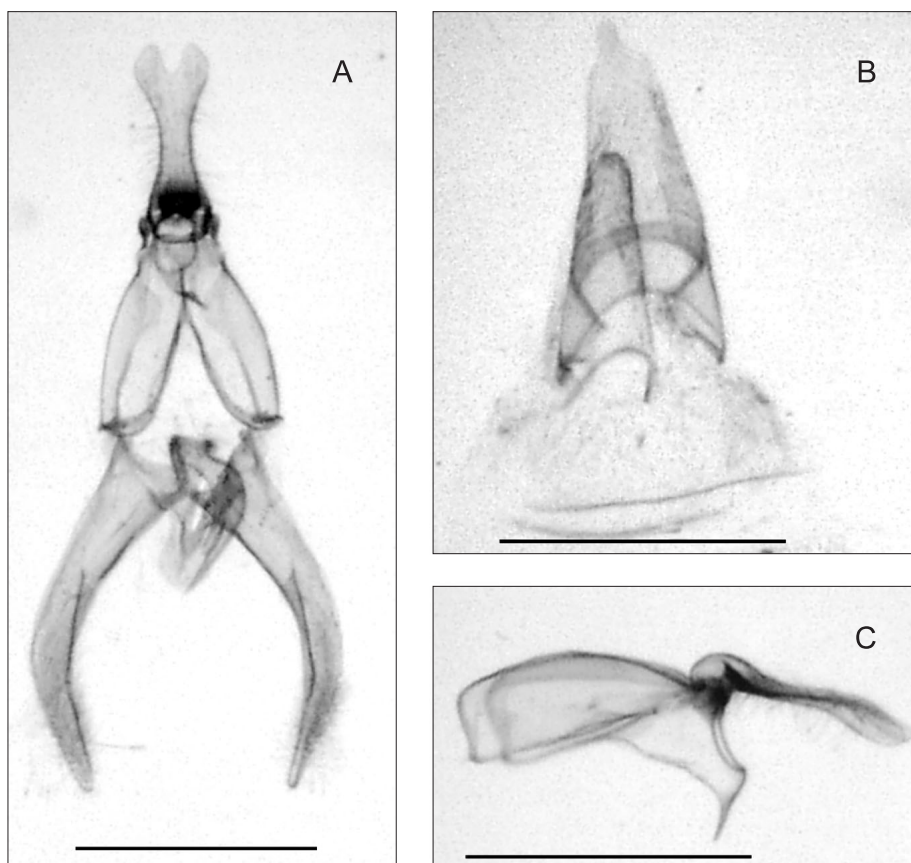


Fig. 4. Male genitalia of *S. mongholica* sp. n. A = uncus-tegumen-gnathos-aedeagus-valvae complex; B = T8 and S8; C = uncus and gnathos, lateral view. Scale bar = 0.5 mm

Scythris bajaranlegi sp. n.
(Figs 5A–C, 6)

Holotype. ♂ MONGOLIA: Uburchangaj aimak 130 km OSO von Somon Bajanleg, 1150 m Exp. Dr. Z. KASZAB, 1967 / Nr. 882 3.VII.1967 / Prep. Gen. N. Passerin d'E. / 4109 ♂ / Genital slide no. 4109 Passerin d'Entrèves / Holotypus *Scythris bajaranlegi* P.E. & R.

Paratypes. 1 ♂ MONGOLIA: Uburchangaj aimak 130 km OSO von Somon Bajanleg, 1150 m Exp. Dr. Z. KASZAB, 1967 / Nr. 882 3.VII.1967 / Prep. Gen. N. Passerin d'E. / 4105 ♂ / Genital slide no. 4105 Passerin d'Entrèves; 1 ♀ MONGOLIA: Uburchangaj aimak 130 km OSO von Somon Bajanleg, 1150 m Exp. Dr. Z. KASZAB, 1967 / Nr. 882 3.VII.1967 / Prep. Gen. N. Passerin d'E. / 4114 ♀ / Genital slide no. 4114 Passerin d'Entrèves.

Description – Male. Wingspan 12 mm. Fore wings narrow, light brown, fringe light brown. Hind wings whitish and glossy, fringe very light brown. Head and thorax brown, abdomen light brown. Legs light brownish. Antennae light brown.

Female. Wingspan 10 mm. Fore wings cream-coloured, fringe very light brown. Hind wings white and glossy, fringe whitish. Head, thorax and abdomen light brown. Legs very light brown. Antennae light brown.

Male genitalia (Fig. 5 A, B, and C). Uncus laminar, notched at apex, well sclerotized at base. The gnathos is turned downward and backward, sharp and short, very enlarged at base and narrowing abruptly toward the well-sclerotized apex. Tegumen almost as long as the valvae, globose. Valvae symmetrical, thick and curved, with setae on the distal half. Aedeagus short, very enlarged at base and narrower at apex. T8 triangular, elongate, with a rounded fore edge; S8 triangular, with a sclerotized thickening at proximal edge and a small scissure at apical edge.

Female genitalia (Fig. 6). Sterigma ringshaped, distally thickened and flattened, bearing two symmetrical expansions on sides. Surroundings of ostium bursae membranaceous, barely visible. Ductus bursae cylindrical, membranous, almost indistinguishable.

Distribution. Known only from Mongolia.

Biology. The species was collected in southern Mongolia at the beginning of July, near a dry salt basin.

Remarks. *Belike, S. bajaranlegi* sp. n. is related to the species of *cicadella* species-group (BENGTSSON 1997a).

Etymology. The species is named after Bajanleg, in Ovorhangay aimak, where it was collected for the first time by KASZAB.

Scythris talyniella sp. n.
(Fig. 5D–F)

Holotype. ♂ MONGOLIA: Bajanchongor aimak, Quelle Talyn Bilgech bulag 47 km O von Grenzposten Caganbulag, 1200 m Exp. Dr. Z. KASZAB, 1967 / Nr. 840 23.VI.1967 / Prep. Gen. N. Passerin d'E. / 4102 ♂ / Genital slide no. 4102 Passerin d'Entrèves / Holotypus *Scythris talyniella* P.E. & R.

Paratype. 1 ♂ MONGOLIA: Bajanchongor aimak, Oase Dzun mod 100 Km S von Somon Schine žinst, 1300 m Exp. Dr. Z. KASZAB, 1967 / Nr. 869 29.VI.1967 / Prep. Gen. N. Passerin d'E. / 4098 ♂ / Genital slide no. 4098 Passerin d'Entrèves.

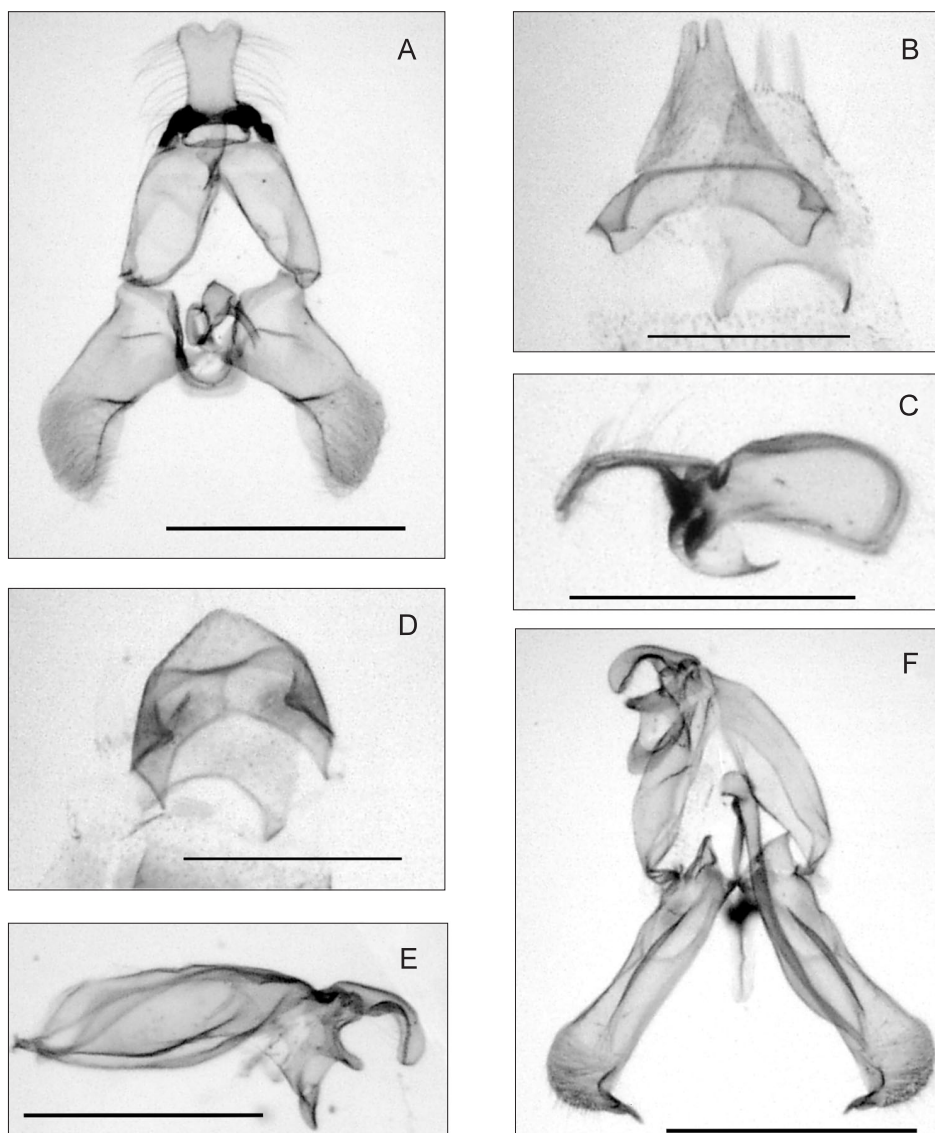
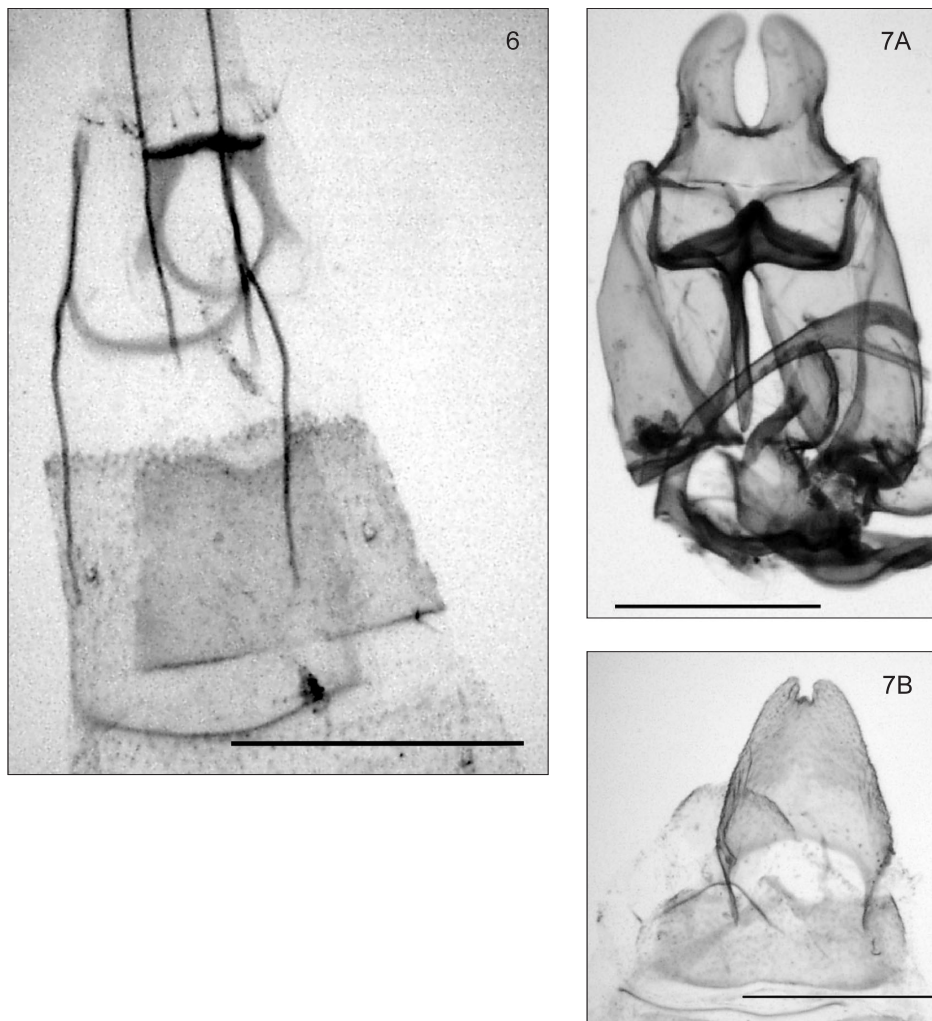


Fig. 5. Male genitalia of *S. bayanlegi* sp. n. A = uncus-tegumen-gnathos-aedeagus-valvae complex; B = T8 and S8; C = uncus and gnathos, lateral view, and *S. talyniella* sp. n. D = T8 and S8; E = uncus and gnathos, lateral view; F = uncus-tegumen-gnathos-aedeagus-valvae complex. Scale bar = 0.5 mm

Description – Male. Wingspan 11 mm. Fore wings very light brown, with a metallic gloss. A darker brown stria in the middle of the wings extends from the base to about two thirds of surface. Wing background entirely covered with light brown spots. Light brown fringe. Hind wings whitish and glossy, with a light brown fringe. Head, thorax and abdomen brown. Legs light brown. Antennae brown, about as long as the fore wings.

Male genitalia (Fig. 5 D, E, and F). Uncus down-curved and domed, one third as long as the tegumen; gnathos triangular, with two laminar processes, large at base and narrowing suddenly to apex, downturned. Tegumen oval and narrow. Valvae symmetrical, straight, but hooked inwards at apex, sharp, with setae in distal third. Aedeagus cylindrical, dorsally concave, as long as the valvae,



Figs 6–7. 6 = Female genitalia of *S. bayanlegi* sp. n. 7 = Male genitalia of *S. gobiensis* sp. n. A = un-cus-tegumen-gnathos-aedeagus-valvae complex; B = T8 and S8. Scale bars = 0.5 mm

with juxta elongate, one third as long as the aedeagus. T8 quadrangular, with a large medial notch in fore edge, hind edge largely rounded; S8 triangular, large, rounded at apex and concave at base.

Female. Unknown.

Distribution. Known only from Mongolia. The species was collected from a very arid zone, where vegetation is only found near surface waters.

Biology. *S. talyniella* sp. n. was collected in the second half of June in a barren desert, where vegetation grew only near watercourses. *Tamarix* and *Nitraria* were found around the Talyn spring, while many poplars grew near the Dzuur-mod oasis.

Remarks. *S. talyniella* sp. n. is not related to any known species-group.

Etymology. The species is named after the spring of Talyn, locus typicus.

Scythis gobiensis sp. n.

(Fig. 7)

Holotype. ♂ MONGOLIA: Gobi Altaj aimak, Zachuj Gobi, 10 km N von Chatan chajrchan Gebirge 1150 m Exp. Dr. Z. KASZAB, 1966 / Nr. 594 27.VI.1966 / Prep. Gen. N. Passerin d'E. / 4075 ♂ / Genital slide no. 4075 Passerin d'Entrèves / Holotypus *Scythis gobiensis* P.E. & R.

Male. Wingspan 14 mm. Fore wings light brown, with a lighter line along the median venation, extending from the base to two thirds of the wing and bifurcating at one-half of the wing. The wing surface also presents a brown triangular patch at apex and a small yellowish linear patch on distal half of the costa, mirroring a brown one near the base. Long brown fringe. Hindwings whitish, with a light fringe darkening toward apex. Head, thorax and abdomen light brown. Legs light brown. Antennae brown, two thirds as long as forewing.

Male genitalia (Fig. 7 A and B). Uncus U-shaped, with apices converging inward. Gnathos well developed, the joining arms elongate and converging in the middle, with a long median process. Tegumen globose, valvae very reduced, as long as the vinculum, spatulate, membranaceous at apex. Aedeagus enlarged and bifid at apex, one tip tubular and the second enlarged and rounded. T8 triangular, rounded at apex, S8 triangular, with a quadrangular notch at apex.

Female. Unknown.

Distribution. Known only from Mongolia.

Biology. The species was collected in Mongolia at the end of June, at the edge of a sandy desert.

Remarks. *S. gobiensis* sp. n. is not related to any known group of species and presents very peculiarly-shaped genitalia, partially fused.

Etymology. The species is named after the Gobi Altay aimak.

***Scythris sachkovi* sp. n.**
(Fig. 8)

Holotype. ♂ MONGOLIA: Bajanchongor aimak, Oase Dzun mod 100 Km S von Somon Schine žinst, 1300 m Exp. Dr. Z. KASZAB, 1967 / Nr. 869 29.VI.1967 / Prep. Gen. N. Passerin d'E. / 4083 ♂ / Genital slide no. 4083 Passerin d'Entrèves / Holotypus *Scythris sachkovi* P.E. & R.

Description – Male. Wingspan 16 mm. Fore wings light brown, with a gilded shine on the whole surface, with sparse, whitish and almost insignificant oval patches. Short, light brown fringe. Light brown and glossy hind wings, with very light brown fringe. Head, thorax and abdomen brown. Legs very light brown. Antennae light brown.

Male genitalia (Fig. 8 A, B, and C). Uncus U-shaped, convex in the middle; gnathos triangular, sharp at apex, the joining arms elongate. Tegumen two thirds as long as the valvae, conical. Valvae symmetrical, bold, arched, with a lobe on apex and setae on lobe and on the inner prominence. Vinculum very short. Aedeagus cylindrical, curved, bifid at apex. T8 trilobate, the two wings on sides rounded. S8 quadrangular, concave posteriorly.

Female. Unknown.

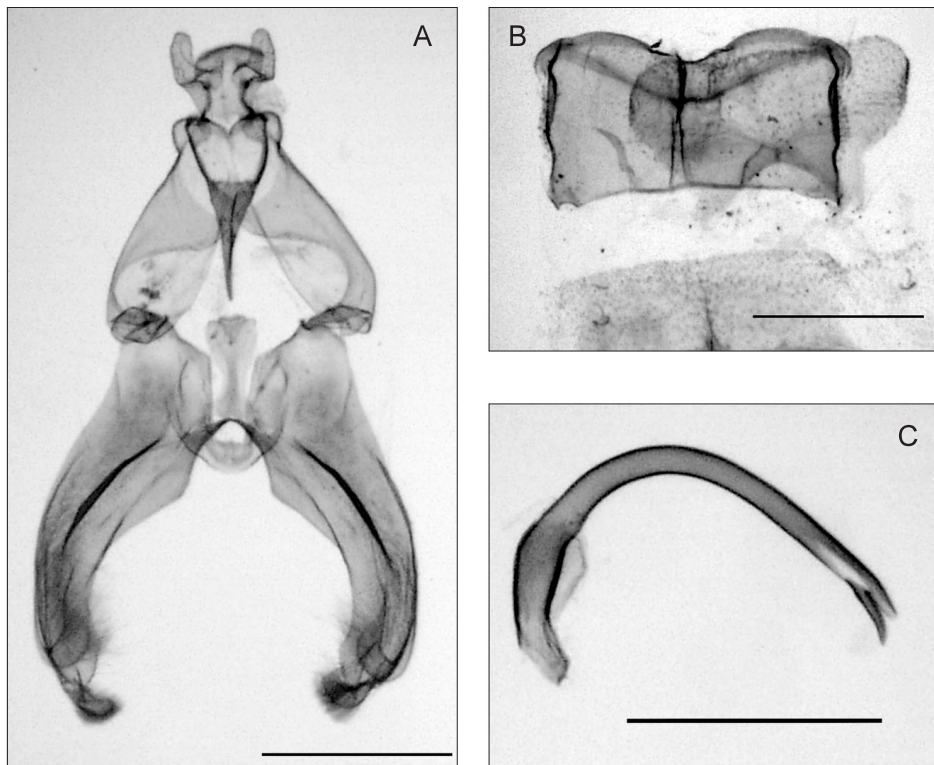


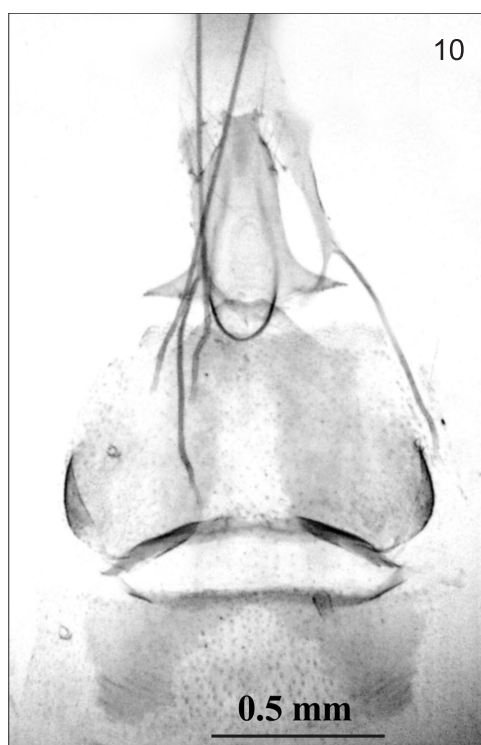
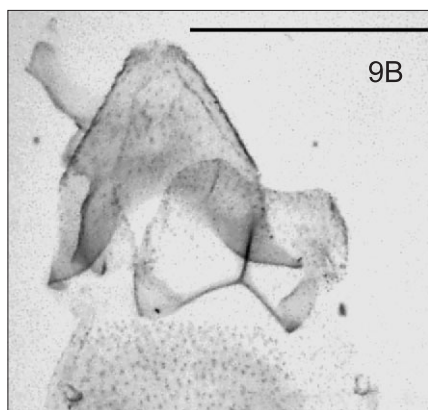
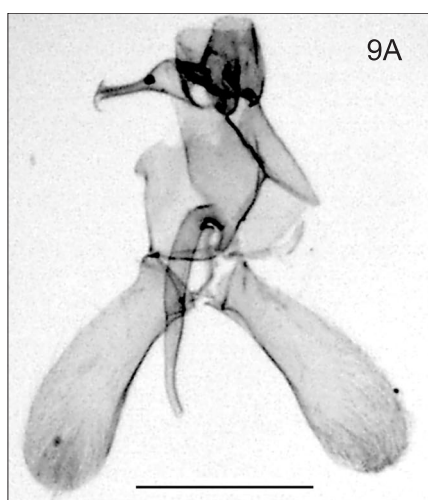
Fig. 8. Male genitalia of *S. sachkovi* sp. n. A: uncus-tegumen-gnathos-valvae complex; B: T8 and S8; C: aedeagus. Scale bar = 0.5 mm

Distribution. Known only from Mongolia.

Biology. The specimen was collected at the end of July, in an oasis with waters rich in ammonia and many poplars.

Remarks. *S. sachkovi* sp. n. is not related to any known species-group.

Etymology. The species is named after S. A. SACHKOV, Russian lepidopterist from Samara University.



Figs 9–10. 9 = Male genitalia of *S. pallidella* sp. n.: A = uncus-tegumen-gnathos-aedeagus-valvae complex; B = T8 and S8. 10 = Female genitalia of *S. cirra* FALKOVITCH. Scale bars = 0.5 mm

Scythris pallidella sp. n.

(Fig. 9)

Holotype. ♂ MONGOLIA: Uburchangaj aimak 130 km OSO von Somon Bajanleg, 1150 m Exp. Dr. Z. KASZAB, 1967 / Nr. 882 3.VII.1967 / Prep. Gen. N. Passerin d'E., 4094 ♂ / Genital slide no. 4094 Passerin d'Entrèves / Holotypus *Scythris pallidella* P.E. & R.

Description – Male. Wingspan 14 mm. Fore wings light brown, with a golden shine. Fringe very light brown. Hind wings whitish, with long, pale fringe. Head, thorax and abdomen brown. Legs and antennae light brown.

Male genitalia (Fig. 9 A, and B). Uncus bilobate; gnathos enlarged at base, the median process narrow and long, ending bifid; tegumen conical. Valvae symmetrical, spatulate, rounded at apex, as long as aedeagus, which is cylindrical and lightly sinuate. T8 quadrangular, with a deep triangular incision at base and a rounded, larger, but less profound one on distal edge; S8 triangular, deeply notched and extending on sides at base, apex rounded.

Female. Unknown.

Distribution. Known only from Mongolia.

Biology. The species was collected between the end of June and the beginning of July in sandy zones, with luxuriant *Tamarix* vegetation.

Remarks. *S. pallidella* sp. n. is not related to any known species-group.

Etymology. The species is named after the light-coloured external features of the specimens collected in Mongolia.

S. ammobia Falkovitch, 1972

Scythris ammobia FALKOVITCH, *Trudy zool. Inst.* **52**: 323.

Material. 1 ♂ (Genital slide no. 9374 Passerin d'Entrèves), MONGOLIA: South Gobi aimag, 25 km N of somon Bulgan, Schovongin chooloi, 1030 m, 1964 Kaszab Expedition, 18.VI.1964; 1 ♂ (Genital slide no. 4095 Passerin d'Entrèves), MONGOLIA: South Gobi aimag, 100 km E of Ovot Chuural Checkpoint, 1250 m, 1967 Kaszab Expedition, 22.VI.1967; 9 ♂♂ (Genital slides no. 4077, 4089, 4092, 4101, 4106, 4107, 4112, 4115 and 4116 Passerin d'Entrèves), 2 ♀♀ (Genital slides no. 4084 and 4090 Passerin d'Entrèves), MONGOLIA: Ovorhangay aymag, 130 km ESE of somon Bajanleg, 1150 m, 1967 Kaszab Expedition, 3.VII.1967.

Distribution. *S. ammobia* is known from Uzbekistan and southern Mongolia. The specimen reported by BENGTTSSON (1997b: 91) from Russia surely does not belong to *S. ammobia*, but is very similar to the females of *S. gorbunovi* NUPPONEN, *S. sinevi* NUPPONEN and *S. cervella* NUPPONEN et NUPPONEN. The sterigma of the *S. ammobia* type specimen reported in FALKOVITCH (1972a: 324) is spindle-shaped, evenly sclerotized, with two paired, elongate and lightly divergent ap-

pendices. Moreover, S8 shows a characteristic sclerotization, entirely lacking in the female specimen reported by BENGTTSSON (1997b).

Remarks. In Mongolia, the species was collected in June in sandy areas with *Tamarix*, *Haloxylon*, *Caragana* and *Zygophyllum* vegetation in July near a dry salt basin. FALKOVITCH collected the species in May and June in the Bukhara region, Uzbekistan.

S. cassiterella (SNELLEN, 1884)

Scythris cassiterella (SNELLEN), *Tijdschr. Ent.* **27**: 178.

Material. 1 ♂ (Genital slide no. 4074 Passerin d'Entrèves), MONGOLIA: Bulgan aymag 20 km NW of somon Chanžargalant, 1350 m, 1968 Kaszab Expedition, 16.VI.1968.

Distribution. The species is known from eastern Siberia, Central Asia, north-western Mongolia and Korea.

Remarks. The host plants are unknown but the species was collected on a gradually declivitous slope, where *Thymus* was the dominant plant. In Mongolia, the species was collected in June in a forest steppe area near a coniferous wood. *S. baikalensis* BENGTTSSON et LIŠKA (1996) was synonymized with *S. cassiterella* by SINEV (2001a), who also remarked that the drawings in FALKOVITCH (1981) and BENGTTSSON and LIŠKA (1996) do not refer to *S. cassiterella*, but to a new species, *S. macrourella* (SINEV, 2001a, b).

S. cirra FALKOVITCH, 1969

Scythris cirra FALKOVITCH, *Vsesoyuznoe Entomologicheskoe Obshchestvo* **1969**: 75.

Material. 3 ♂♂ and 4 ♀♀ (Genital slide no. 4085, 4087, 4117, 4078, 4080, 4081, 4088 Passerin d'Entrèves), MONGOLIA: Bayanhongor aymag, Talyn spring, Bilgech bulag, 47 km E of the Caganbulag Checkpoint, 1200 m, 1967 Kaszab Expedition, 23.VI.1967; 1 ♂ (Genital slide no. 4079 Passerin d'Entrèves), MONGOLIA: Bayanhongor aymag, Cagan Bogd Uul, Tooroin bulag, 13 km E of the Caganbulag Checkpoint, 1500 m, 1967 Kaszab Expedition, 24.VI.1967; 1 ♂ (Genital slide no. 4103 Passerin d'Entrèves), MONGOLIA: Ovorhangay aymag, 130 km ESE of somon Bajanleg, 1150 m, 1967 Kaszab Expedition, 3.VII.1967; 1 ♀ (Genital slide no. 4096 Passerin d'Entrèves), MONGOLIA: Bayanhongor aymag, Ehiyn-gol oasis, 90 km NE of the Caganbulag Checkpoint, 950 m, 1967 Kaszab Expedition, 28.VI.1967.

Female. Wingspan 18 mm. Fore wings light brown, with a white zigzag line along the median venation, extending from base to apex of wing, ending at fore edge near the costa. In some specimens the line is interrupted. Fringe brown. Hind wings lighter than fore wings, glossy, with a long, light

brownish fringe. Head, thorax and abdomen light brown, with sparse, irregular, cream coloured scales. Legs light brown. Antennae light cream, half as long as fore wing.

Female genitalia (Fig. 10). Sterigma subtriangular, truncate at apex, extending on sides at base and with a U-shaped, well-sclerotized structure delimiting a groove containing ostium bursae. Ductus bursae membranaceous and wrinkled. S7 subtriangular, sclerotized on sides; bilobate, sclerotized area at posterior edge in S6.

Distribution. The species is known from Central Asia (Uzbekistan and Turkmenia) and southern Mongolia.

Remarks. FALKOVITCH collected the species on *Aellenia subaphylla* and *Haloxylon aphyllum*, in May, June, July and September. In Mongolia, the species was collected by KASZAB in June and July, in a desert area, near oases with *Nitria*, *Tamarix* and *Haloxylon* vegetation. The female of *S. cirra* is described here for the first time.

S. hamatella NUPPONEN et NUPPONEN, 2001

Scythris hamatella NUPPONEN et NUPPONEN, *Entomol. Fenn.* **12**: 85.

Material. 1 ♀ (Genital slide no. 4093 Passerin d'Entrèves), MONGOLIA: Gobi Altay aimag, Chasat chajrchan Uul Range, about 20 km S of somon Zargalan, 2400 m, 1966 Kaszab Expedition, 15.VII.1966.

Distribution. The species is known from Altay, Russia, and from Gobi Altay, western Mongolia.

Remarks. In Altay, the species was collected in June and early July in a dry *Artemisia*-steppe (NUPPONEN & NUPPONEN 2001); in Mongolia it was collected in mid-July in a mountain steppe meadow near a coniferous wood.

S. mikkolai SINEV, 1993

Scythris mikkolai SINEV, *Vest. Zool.* **2**: 54.

Material. 1 ♂ (Genital slide no. 801 Passerin d'Entrèves), MONGOLIA: Hentiy aimag, SW somon Zanchermandal and somon Zargaltchaan, 1400 m, 1965 Kaszab Expedition, 27.VII.1965.

Distribution. The species is known from Russia (Promoriye, S Siberia, S Ural, Samara region, S Buryatia) and from northeastern Mongolia.

Remarks. The species was collected in June (Russia) and July (Mongolia). NUPPONEN (2003) reported that the species is very abundant in various kinds of steppe habitats.

S. obliqua FALKOVITCH, 1969

Scythris obliqua FALKOVITCH, *Vsesoyuznoe Entomologicheskoe Obshchestvo* **1969**: 80.

Material. 1 ♂ (Genital slide no. 4091 Passerin d'Entrèves), MONGOLIA: Ovorhangay aimag, 130 km ESE of somon Bajanleg, 1150 m, 1967 Kaszab Expedition, 3.VII.1967.

Distribution. The species is known from Uzbekistan and southern Mongolia.

Remarks. The species was collected in May and June on *Salsola arbuscola* and *Salsola rigida*. In Mongolia, it was collected in July, in a desert area, near a dry salt basin.

S. orientella SINEV, 2001

Scythris orientella SINEV, *Trudy zool. Inst.* **291**: 15.

Material. 1 ♂ (Genital slide no. 4073 Passerin d'Entrèves), MONGOLIA: Bulgan aimag, 20 km NW of somon Chanžargalant, 1350 m, 1968 Kaszab Expedition, 22.VII.1968; 1 ♂ (Genital slide no. 4086 Passerin d'Entrèves), MONGOLIA: Hövsgöl aimag, 4 km NW of the town of Mörön 1500 m, 1968 Kaszab Expedition, 18.VII.1968; 1 ♂ (Genital slide no. 798 Passerin d'Entrèves), MONGOLIA: Suhbaatar aimag, Moltsog Els, 2 km S of somon Ovoot, 1150 m, 1965 Kaszab Expedition, 6.VIII.1965; 1 ♂ (Genital slide no. 811 Passerin d'Entrèves), MONGOLIA: Choybalsan aimag, Chamardavaa Uul, 80 km SE of Halhyn gol river, near somon Halhyn gol, 600 m, 1965 Kaszab Expedition, 12.VIII.1965.

Distribution. *S. orientella* is known from eastern Russia and Mongolia, where it is widely distributed.

Remarks. The specimens were collected by KASZAB from the second half of July to mid-August in sandy areas (eastern Mongolia) and near coniferous woods (central-northern Mongolia). SINEV (2001a) collected the species in the same period of the year in Russia and eastern Mongolia. *S. orientella* is related to the *S. pascuella* species-group (BENGTSSON 1997a), like many other species found in the area.

S. physalis FALKOVITCH, 1972

Scythris physalis FALKOVITCH, *Trudy zool. Inst.* **52**: 325.

Material. 1 ♂ (Genital slide no. 4108 Passerin d'Entrèves), MONGOLIA: South Gobi aimag, 100 km W of Ovot Chuural Checkpoint, 1250 m, 1967 Kaszab Expedition, 22.VI.1967; 1 ♀ (Genital slide no. 4104 Passerin d'Entrèves), MONGOLIA: Ovorhangay aymag, 130 km ESE of somon Bajanleg, 1150 m, 1967 Kaszab Expedition, 3.VII.1967.

Distribution. *S. physalis* is known from Uzbekistan and southern Mongolia.

Remarks. The host plants are unknown, but in Mongolia the species was collected in June, on the edge of a hill with luxuriant *Tamarix* and *Haloxylon* vegetation, and then in July on sandy hills covered with *Tamarix*. FALKOVITCH collected the species in the Bukhara region in August and September.

S. sinevi NUPPONEN, 2003

Scythris sinevi NUPPONEN, *Entomol. Fenn.* **12**: 41.

Material. 1 ♀ (Genital slide no. 9375 Passerin d'Entrèves), MONGOLIA: Choybalsan aymag, SW shore of the Bujir Nuur, 585 m, 1965 Kaszab Expedition, 11.VIII.1965.

Distribution. *S. sinevi* is known from Mongolia and eastern Russia.

Remarks. The species was collected by KASZAB in August and by NUPPONEN in June and October.

S. ustjuzhanini SACHKOV et SINEV, 2001

Scythris ustjuzhanini SACHKOV et SINEV, *Trudy zool. inst.* **291**: 28.

Material. 1 ♀ (Genital slide no. 4082 Passerin d'Entrèves), MONGOLIA: Bulgan aymag, 20 km NW of somon Chanžargalant, 1350 m, 1968 Kaszab Expedition, 22.VII.1968.

Distribution. The species is known from Russia and northern Mongolia.

Remarks. The species was collected in July near a coniferous wood, in northern Mongolia.

CONCLUSIONS

At present only 26 *Scythris* species are known from Mongolia, mainly from arid steppe and desert steppe; none is known from the driest deserts. We do not have information on the host-plants of the species described and recorded here. Nevertheless, general hints about the vegetational characteristics of the areas where scythridids are most likely to be found in Mongolia were obtained from KASZAB's expeditions notes (see Appendix).

Our results clearly show the scarce and fragmented nature of the information on the scythridid fauna of Mongolia. This contrasts with the general species richness of the scythridid fauna of the Western and Eastern Palaearctic, a contrast that is emphasized by the fact that Mongolia covers an area about the size of Alaska.

There are many reasons for the scarcity of data, above all the difficulty in collecting specimens. Analysis of the KASZAB material from Mongolia shows that the scythridids constitute an insignificant percentage (about the 0.16%) of the total lepidopteran sample. Moreover, this represents the general rule more than an exception in the collection of scythridid specimens.

The complete lack of information from many regions of the world further compromises the potential use of scythridids in biogeographical studies. It would be of great interest, and very useful to the present study, to have information on the scythridid distribution in northern China, e.g. in the Junggar area whose orography and vegetation composition are the same as in southern Mongolia. Scythridids would almost certainly be found in these areas, but this must be confirmed by a careful evaluation of the collection data, especially since human activities have profoundly affected the vegetational cover in northern China.

The scarce information on host-plants could affect the accuracy of analyses of distribution patterns in scythridid fauna and interpretations of the global diffusion. Learning more about host-plants and larval stages would also provide a better understanding of phylogenetic relationships among scythridids, and the current knowledge on species biology would surely be enhanced.

Furthermore, the extreme similarity of external features often makes it difficult to correctly identify specimens. A very careful examination of the collections would likely lead to the retrieval of misclassified material, the identification of several new species and the collection of important new data on scythridid distribution in the Eastern Palaearctic.

Because of our study, the distribution of many species previously known only from very restricted zones of Uzbekistan and Kazakhstan (e. g. *S. cirra*, or *S. ammobia*) have been extended eastwards to Mongolia; several other species would very likely be found in a far more extensive area than expected. All the species

with restricted distribution areas (such as many of the species recently collected in Mongolia and surrounding areas) should be carefully checked to ascertain if they are endemic or only poorly known species.

For various reasons, it is legitimate to assume that there are at least as many scythridid species in the Eastern Palaearctic as in Western Palaearctic.

*

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APPENDIX

More details of the scythruid collection localities are reported here, as mentioned in KASZAB's notes which were published yearly after each journey from 1964 to 1969. The numbers in the table correspond to those on the map of KASZAB's expeditions (Fig. 2).

First expedition: 15th June–16th July 1963

1. On 22nd June, KASZAB collected in a semidesert zone in Chara-Eireg and Sainschand. Afterwards, the expedition went southward and from Zuun Bajan travelled in a partly desert region to Cagan Elis, the first halting-place, a large sandy area about 30 km SSE of Zuun Bajan. The vegetation in Cagan Elis consisted mainly of *Caragana*. The plants were scattered, 5–6 m from the shrubs and never amidst them. Despite the poor vegetation, the fauna was rather abundant, although it hardly stirred in the sand during the day. The desert came to life at night. Excavation was the best method to find insects, which were collected mainly by digging around plants (most of all Coleoptera). During the night, a sandstorm rose up and KASZAB could collect many interesting insects.

Second expedition: 10th June–13th July 1964

2. On 18th June, the expedition left the third halting-place, a sandy bank of a saltwater lake near Mandal-ovo, and went SW to the flooded and flat region of Ulaan Lake. The vegetation was rather varied on the sandy argillaceous soil, which was almost cragged every now and then. After proceeding southward, the expedition encamped 25 km north of Somon Bulgan, at the foot of the Schovongin Chooloi, a lower mountain chain running east to west. The mountain range rose up from the sand as a sharply toothed ridge and the rocks were covered by darkish desert varnish. Bushes of *Haloxylon* (= *Saxaul*), *Caragana* and *Zygophyllum* grew on the loose unstable sand covering the mountain slopes. Many insects were collected in the sand at sunset, while at night KASZAB collected by lamp around the camp. The next day, he collected specimens under stones, among roots, and also picked them from the sand and collected them from *Haloxylon* (= *Saxaul*) and *Zygophyllum* by striking the plants.

Third expedition: 21st July–2nd September 1965

3. On 27th July, KASZAB left the first halting-place, on the bank of the Kerulen River about 45 km E to Bajandelger, and moved eastward. The next stop was a mountainous steppe meadow, between the Zenchermandal district and the Zargalchaan district, 10 km from the first halting-place near the Kerulen River. Here, the wide mountain range was interrupted by massive rocks. The steppe leading down to the valley was completely in flower and showed characteristic mesophytic vegetation; the soil was rich in humus. In the upper areas, the soil was stony and the vegetation sparse. In the second camp, KASZAB could only collect by net because the diversified vegetation was moistened by rain. In a place sheltered by rocks, he dug some ethylene glycol traps and at midnight collected by lamp, until a strong wind rose up.

4. On 5th August, the expedition proceeded SW to the small river Bayan gol. During the journey, KASZAB collected near the village of Chongor and in the dry salt basin. However, he had to move on since a storm rose up and he could not stop in the place as planned. In the late afternoon of the same day, the expedition reached the town of Ovoot (= Somon Dariganga), near the sandy hills of Molzog Elis, and encamped at the top of a dune, where KASZAB collected successfully at night and during the day on both 5th and 6th August, despite the rain.

5. On 11th August, the expedition reached Bujr Nuur, an impressive freshwater lake, and encamped on its SW shore. Here, KASZAB collected by fishing-net from a small rainwater pool, by various methods on the sandy hillocks surrounding the camp and on plant roots, and by net on the sparse vegetation.

6. On 12th August KASZAB moved NE and reached the river Halhyn gol (= Chalchin gol) near the homonymous village, then proceeded along the boundary with a local guide on the left bank of the river to the loess hills of Chamardavaa and the sandy zone near the river. KASZAB collected during the journey, and by lamp at night after encamping in the plain among the dunes.

Fourth expedition: 1st June–31st July 1966

7. On 27th June, the expedition crossed the Gobi Altay Range and KASZAB collected under stones near Zogt, on a Pass south of Zogt (2500 m), and in a narrow south-facing gorge (1900 m). The expedition then reached Chatan chajrchan Mountain, which rose on the sandy desert Zachul Gobi. *Haloxylon* (= *Saxaul*), *Nitraria* and *Tamarix* grew at the foot of the mountain. KASZAB pitched camp on the edge of the variegated sandy desert. Part of the plain was settled for farming and the *Draba* blossomed in the ploughed field, which was sown with cereals, as well as in the flowering fallow ground. Many insects were found there and KASZAB also collected successfully on *Tamarix* and *Nitraria* and by pitfall traps, until a chill wind rose in the evening.

8. On 29th June, after a day-long journey from Altay through the Dzungarian Gobi, KASZAB reached the Pass between the Aj Bogd Uul Mountain and the Tachijn Schar Nuruu Range, pitching camp in a barren *Saxaul*-semidesert. Here, some insects were collected from the ground and under stones; in the evening, KASZAB tried to collect by lamp, but a sandstorm started to blow.

9. On 15th July, KASZAB travelled through the Chasat Chajrchan Uul Plateau to a valley 20 km S of Zargalan (2400 m a.s.l.). The camp was pitched in the valley surrounded by high mountains, alongside a coniferous wood, on a blossoming mountain steppe meadow. Along the watercourse in the valley bottom, KASZAB collected from flowering shrubs, in grass, in a glade, by net on flowers and under stones. He also set a Malaise-trap protected by a rock. Despite a considerable drop in temperature, he also collected successfully by lamp at night.

Fifth expedition: 24th May–30th July 1967

10. Near the Ovot Chuural checkpoint, nasty weather hampered the collecting for several days. In the morning of 22nd June, the wind finally ceased and KASZAB moved westward from the Muchor orege gol spring on virtually flat, very argillaceous soil, which lowered southward and was covered with pebbles. There were also some sandy hillocks. KASZAB encamped about 20 km SW of Chanzargalant district, on the edge of a hill with luxuriant vegetation (*Tamarix* and *Haloxylon* – *Saxaul*). This proved to be an excellent place to collect specimens, mainly from the ground and in sand amidst the down-curved *Saxaul* branches, where many interesting species were found. Collecting at night was also very fruitful.

11. On 23rd June, KASZAB proceeded on wasted barren land, in weather as bad as the previous days. He encamped at Talyn, a spring on a virtually flat terrain, halfway to the Tost and Cagan Bogd Mountains. The place lies at the edge of a large desert with *Nitraria*, and is encircled by a dense reed beds. The depressions were filled with sand mingled with soda and clay. All around, there was a barren stony desert, with bushy vegetation only near watercourses. *Thermopsis* grew on the riverbanks, while there was *Tamarix* on the hills and *Nitraria* in the sandy depressions. Specimens were collected from the vegetation on the riverbanks, from the ground and from plants till one o'clock and by lamp at night.

12. On 24th June, KASZAB continued the journey southwestward, avoiding the Cagan Bogd Range. He collected specimens from *Tamarix* and by shaking the trees in a deep valley enclosed by cragged mountains, near a filled and drained source. Then he reached Tooroin bulag, where there was another dry spring, surrounded by poplars and *Tamarix*. The little oasis extended southward to a wide river, then to a desert. Mainly *Saxaul* and *Tamarix* grew here. The weather was ugly and KASZAB collected very few specimens. He then moved on to the Cagan bulag checkpoint, encamping in a wide south-facing cleft near the Chinese border. He collected specimens on stony slopes of the mountain encircling the river, under stones and by lamp at night, despite the stormy weather.

13. On 27th June, KASZAB arrived at Ehiyn-gol, a relatively large oasis about 90 km NE of Cagan bulag which was crossed by a river used to irrigate melon, tomato and cucumber fields. The oasis was in the middle of a sandy desert, covered by blossoming *Tamarix* and by *Saxaul* and spotted here and there with old poplar-groves with wasted trees. Reed beds were in the wettest points and around the stream, and *Nitraria* could also be found. Flowering *Cirsium* unevenly covered the deepest sites. KASZAB encamped in the middle of the oasis on a gravel terrace, and collected by Malaise-trap and by pitfall traps in a clearing encircled by flowering *Tamarix*, from the sand, from plants, from flowering *Tamarix*, from flowering *Nitraria*, from the river vegetation and from the reed beds. Collecting at night was also very fruitful.

14. On 29th June, KASZAB went northward to Schine zinst. North of the oasis, in the deepest part of the stagnant pond, he climbed to Ongon Ulaan Mountain on unsteady, precipitous ground, often stopping and collecting specimens on the bare and gravelly soil. Leaving Ongon Ulaan Mountain, the expedition reached Dzuur-mod, 95 km from Ehiyn-gol. The oasis was named after the almost 100 poplars in the area. The water was rich in ammonia and not drinkable. KASZAB collected successfully from dusk till night.

15. On 3rd July, after a long and difficult journey, KASZAB reached the Chacar-usni Chudag sources, about 100 km ESE of Bajanleg. In the surrounding, massive sand hills were covered by luxuriant *Tamarix* vegetation. There were also reeds around the stagnant basin. Very few specimens were collected there. Halfway between Bajanleg and Bulgan, he set up the tents at dusk on the edge of a dry salt basin bordered to the east by a mountain chain with white sedimentary rocks. Very few specimens were found during the day, but many specimens were collected by lamp at night.

Sixth expedition: 30th May–2nd August 1968

16. On 16th June, after crossing the Orchon River and leaving Bulgan KASZAB encamped NW of Chanzargalant, near a valley with a watercourse. He pitched the tents in a lateral open valley, at the edge of an ancient coniferous wood at the bottom of a gorge. KASZAB dug some traps at the edge of the wood and on the steep rocky cliffs, and then collected in the valley bottom from a thick scrub, from flowering shrubs, by pitfall trap and by Malaise-trap. At night, he collected by lamp.

The 22nd July, on the return trip, KASZAB came back in this locality, but he did not find many specimens in the traps because of the abundant rainfall. Collecting by net (during the day) and by lamp (at night) gave far better results.

17. On 18th July, KASZAB arrived at the southern shore of Hövsgöl Nuur Lake, north to Chatgal, and pitched the tents in a glade on a wooded and precipitous hill on the lakeshore. On the western side of the mountain facing the lake, KASZAB successfully collected at the edge of the wood and in the glade, by net and by pitfall trap. At night, many insects crowded around the lamp and were so numerous that only a relatively small number could be collected.