The leaf-rollers (Lepidoptera, Tortricidae) of Western Tuva, with description of *Cochylimorpha arenosana* sp. n.[1)]

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A list of 145 species of the family Tortricidae, recorded from the western part of Tuva, is presented. The material studied originates from a joint Finnish-Russian expedition made in June 1995. Additional data have been taken from Ukrainian, Russian and German literature. *Cochylimorpha arenosana* n. sp. from sand dunes of Northern Mongolia is described. Three species, *Falseuncaria lechriotoma* Razowski, 1970, *Acleris idonea* Razowski, 1972 and *Eucosma argentifera* Razowski, 1972 — all described from Mongolia — are reported as new for Russia. From the total of 145 species 138 can be placed into three main zoogeographical complexes: Holarctic/Palaearctic about 83%, Mediterranean-Central-Asiatic about 10% and endemic for the mountains of Central-Asia about 7%. The Holarctic complex can be divided into four chorological groups: Holarctic (22 spp.), Transpalaearctic (65 spp.), Western Palaearctic (12 spp.) and Eastern Palaearctic (13 spp.). Subalpine meadows and grazed steppes of Mongun-Taiga and the Tannu-Ola Mnts. are inhabited by some endemics of the Central-Asian mountains (11 spp.).

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1. Introduction

The mountains of Tuva form a border between the boreal forests and the arid steppes. Certain mountain ranges (e.g., the Sayan and the Tannu-Ola Mnts.) have been a barrier for many Central-Asiatic endemics to extend their distribution area north of Tuva. The fauna of Tuva contains many local Tuvian-Mongolian steppe species.

Some articles about Tortricidae have been published from Central-Siberia, e.g., Falkovich (1970, from the Kuznetskiy Ala-Tau) and Kuznetsov and Jalava (1988, from the Altai and Hamar-Daban). From Mongolia, three articles about Tortricidae have been published: Razowski (1966, 1972) and Kuznetsov (1975). Most of the material for studies of the Mongolian fauna originates from the expeditions organized by Dr. I. M. Kerzhner from St. Petersburg Zoological Institute and by Dr. Z. Kaszab from the Hungarian National Museum in Bu-

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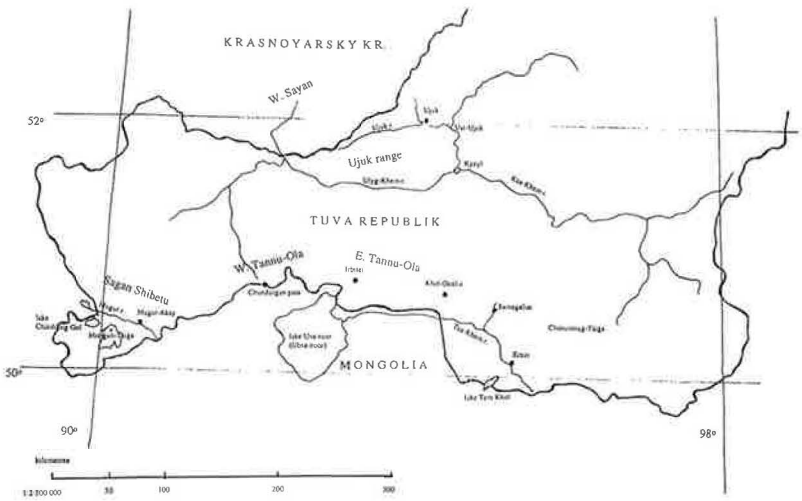

Fig. 1. Map of Tuva with the most important collecting localities.

dapest. Specimens labelled 'Ost-Tannuola, Shawyr', studied by Rebel in 1917 do not originate from Tuva, but from the upper flow of the River Shawryn-gol in Mongolia (Kuznetsov 1975).

The most important papers on the Tuvian Tortricidae are those by Ju. A. Kostjuk (1971, 1975b) who made two expeditions to Tuva in 1968 and 1969. His two additional articles deal with descriptions of new species (Kostjuk 1973, 1975a). The total catch of his material of Tortricidae was about 2 000 specimens belonging to 120 spp. His collection is deposited in the Zoological Museum of Ukrainian Academy of Sciences, Kiew. We have not studied this material, so our data is based solely on the literature and may contain some misidentifications. The doubtful cases are considered in the third chapter under each species.

2. The study area, material and methods

We restricted our studies to the western parts of Tuva, because no material is available from the easternmost parts.

The study area is situated between the Mountain massives of Mongun-Taiga about 50°N 90°E in the west and Chorumnug-Taiga about 50°40´N 96°E in the east (Fig. 1). Most part of the area is steppe highland about 1 000 metres above sea level. The lowest places are the capital of Tuva, Kyzyl (700 m a.s.l.) and the salt-lake Ubsu-Nur (Uvs-Nuur) 750 m, the highest one 3 500 m (Mongun-Taiga).

The present article treats the new materials collected in June 1995 by a Finnish-Russian joint expedition. The moths were collected by Jukka Jalava and Jaakko Kullberg in the period 3.–19.VI.1995. The material, altogether about 400 specimens, is mostly deposited in the Zoological Museum of Helsinki (MZH), some duplicates are in the Zoological Institute of St. Petersburg (ZIN).

For nigth-time collecting two Osram's Lumilux Combi 18 W black-light tubes and one 125 W mercury vapour lamp with traps runned by a Honda 350 W generator were used. Netting and sweeping were used at daylight.

The main collecting localities of the Finnish-Russian expedition are: — 1: Ust-Uyuk, 52°04´N 94°22´E, 670 m a.s.l., where the River Uyuk flows into Yenisei, treeless steppe hills, with *Populus laurifolia* stands by the Riverside. 3.– 5.VI. — 2: Kyzyl, 51°43´N 94°27´E, 700 m, a semidesert-like arid biotope with autumn green vegetation called nanophyton-steppe with small hills just outside the town. No light-trapping. 5.–6.VI., 20.VI. — 3: Near Erzin, 50°16´N 94°54´E, 1250 m. Even, grassy steppe with hills of sand-stone rising ca. 100 m above the steppe. The slopes of the hills have a rich vegetation of different 'pea-bushes' (*Caragana*, *Ononis* etc.), *Thalictrum*, *Artemisia* and Poaceae. The even steppe was in nearly natural condition, only a little pastured, mainly by horses. 7.–10.VI. — 4: Tere-Khol, 50°01´N 95°03´E, 1 150 m. Fine sand dunes by the Tere-Khol-lake shore, a corner of a huge, 300 km long sand-dune area in northern Mongolia reaching westwards to Lake Ubsu-Nur. The dunes have a scarce vegetation with scattered pea-bushes, tufts of Poaceae and a very spiny Fabaceae (*Astragalus* ? *pycnophyllus*). The camp was situated near the lake shore beside a small, wet *Carex-Tomentypnum* (moss)- bog with *Betula* sp. and big trees of *P. laurifolia*. 10.–12.VI. — 5: Irbitei, 50°44´N 93°08´E, 1 000 m. Irbitei River valley. A narrow, steep-sloped valley with thick forest of *Populus laurifolia* and pea-bushes on the bottom, rising to dry *Artemisia*-steppes and scree slopes. The place had been inhabited and was heavily pastured. Beside the yurtas, *Ballota* sp., *Chenopodium* sp. and *Urtica cannabina* were growing. 13.–16.VI. — 6: Ubsu-Nur, 50°40´N 92°58´E, 750 m. Shore meadows of the big salt lake Ubsu-

Nur. The vegetation near the shore was mainly tall broad-leaved Poaceae and big and very spiny pea-bushes. Further from the shore there was an arid nanophyton-steppe. 15.VI. — 7: Khol-Oozhu, 50°45´N 94°29´E, 1 200 m. A narrow valley of a narrow and rapid mountain creek with *Larix*, *Alnus viridis* and *Populus laurifolia* along it. The steppe slopes, rising about 150 m from the creek were especially rich in flowering meadows. 16.–19.VI. — 8: E-Tannu-Ola 2 175 m, 50°50´N 94°19´E. At the timber line (*Larix, Pinus cembra*). The last and highest steppe-slopes. 8.VI., 17.VI.

The main collecting localities of Ju. A. Kostjuk were as follows: — 9: Mongun-Taiga. The highest mountains of Tuva, 3000–3500 m, mountain pastures on alpine meadows and mountain tundras. — 10: Mugur-Aksy and Shara-Sur. The Sagan-Shibetu Range- localities on the lower flow of Tes-Khem River, 2 100 m. — 11: Samagaltai, Chorumnug-Taiga Range, 50 km W of Samagaltai. — 12: Chundurgan. Western Tannu-Ola Mnts., Chundurgan pass in upper Ulug-Chundurgej River, 1900 m, mountain tundra. — 13: Tes-Khem River bank near Erzin.

3. Description of *Cochylimorpha arenosana* sp. n.

Fig. 2 a, b, c. and male genitalia Fig. 3.

Type material. — Holotype ♂: Russia, Tuva rep. Lake Tere-Khol, sand dunes, 10.–12.VI.1995, Jalava and Kullberg. Holotype prep. no. 12/17.6.1996 J. Kullberg. 10 ♂♂ paratypes: same data as holotype. Holotype and nine paratypes in coll. MZH, one paratype in coll. ZIN.

Diagnosis. — The forewing pattern and coloration resembles that of *C. hedemanniana* (Snellen, 1883), but the forewing is more elongate, the rusty brown coloration less distinct and the ground colour more creamy. The male genitalia also have some resemblance to *C. hedemanniana* in having two cornuti in the aedeagus. In *C. arenosana* sp. n. the two cornuti are equal in length, in *C. hedemanniana* one cornutus is shorter and more slender than the other. Also the valva is different: that of *C. arenosana* is broader and the sacculus is longer and with a clear apical project (as in some species of the genus *Phtheochroa*). This apical project is weakly present in some species of *Cochylimorpha*, but never as strong as in *C. arenosana* sp. n.

Description. – Wingspan 15–17.5 mm. Head, labial palpi and thorax creamy white. Forewing very narrow and long, costa straight, termen very oblique. Ground colour of forewing creamy white with following rusty yellow pattern: basal part of wing, dorsal spot medially, enlargened to outward bent fascia and outer part of wing. Shade of rusty colour varying from brownish to yellowish. Cilia yellowish. Hind wing and its cilia dirty white.

Male genitalia: Uncus absent. Socius with thin hairs. Median process of transtilla very narrow. Valva broad with laterally strongly widened, concave sacculus, ending to strongly pointed apical process. Aedeagus very simple, thick and almost straight. Vesica with two cornuti of almost equal lenght: one thin and straight, the other thicker and slightly curved.

Female genitalia: Unknown.

Etymology. — The name *arenosana* refers to the habitat of the type locality, huge sand dunes of Northern Mongolia.

Distribution. — Known only from the type locality, Lake Tere-Khol on the Mongolian–Tuvian border.

Biology. — Unknown, except the habitat and flight period: sand dunes in the first half of June.

4. List of species

Figs. 2 and 4.

The systematics are according to Kuznetsov 1978 with some new nomenclatorical changes. The general distributions are based on the literature by Danilevsky and Kuznetsov (1968), Falkovich (1970), Razowski (1970, 1972), Kuznetsov (1978), Hodges (1983), Kuznetsov and Jalava (1988), Kuznetsov and Mikkola (1991), Karsholt and Razowski (1996) and Kuznetsov, Kaila and Mikkola (1996), some unpublished data is included from coll. MZH.

Cochylini

Falseuncaria ruficiliana (Haworth, 1811). — Khol-Oozhu 16.–19.VI.1995; E-Tannu-Ola 2175 m. 17.VI.1995; 10 exx. Uyuk Range, env. Seserlig; E-Tannu-Ola, Ak-Tshira and Tes-Khem River bank near Erzin (Kostjuk 1971) as *F. ciliella* (Hübner, 1796). — Western Palaearctic.

F. lechriotoma Razowski, 1970. — Khol-Oozhu 16.–19.VI.1995, 2 ♂♂. — Until now known only from Mongolia. New for the fauna of Tuva and Russia. Imago, male and female genitalia are figured in Razowski 1970.

Cochylis nana (Haworth, 1811). — Tes-Khem River banks near Erzin (Kostjuk 1971 as *Acornutia nana*). — Holarctic.

Cochylidia moguntiana (Rössler, 1864). — Ust-Uyuk 3.–

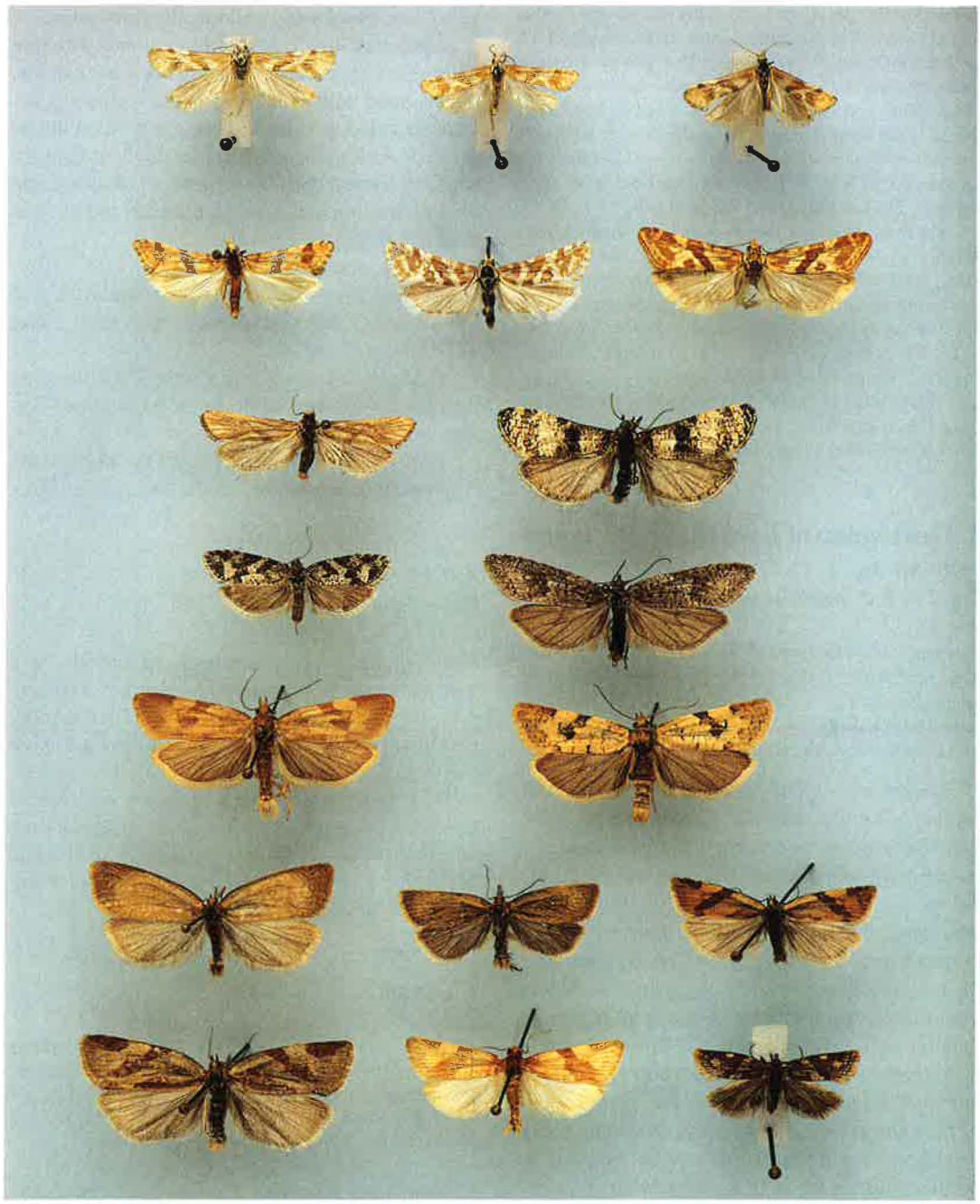

Fig. 2. Downwards and from left to right. 1st. row: — a. *Cochylimorpha arenosana* sp. n. (holotype ♂); — b. Ditto (paratype ♂); — c. Ditto (paratype ♂); 2nd. row: — d. *Cochylimorpha asiana* ♂ (Tuva); — e. *Cochylimorpha emiliana* ♂ (Tuva); — f. *Cochylimorpha obliquana* ♂ (Tuva); 3rd. row: — g. *Cochylimorpha fucatana* ♂ (Tuva); — h. *Phtheochroa pistrinana* ♂; 4th. row: — i. *Cnephasia novickii* ♂ (Tuva); — j. *Amphicoecia adamana* ♂ (Altai); 5th. row: — k. *Aphelia aglossana* ♂ (Tuva); — l. Ditto ♂ (Tuva); 6th. row: — m. *Clepsis crispinana* ♂ (Altai); — n. *Clepsis rogana* ♂ (Polar Ural); — o. *Clepsis danilevskyi* ♂ (Polar Ural); 7th. row: — p. *Clepsis aerosana* ♂ (Tuva); — q. *Clepsis praeclarana* ♂ (Kirgisia); — r. *Clepsis tannuolana* ♂ (Altai). Photo E. Roine.

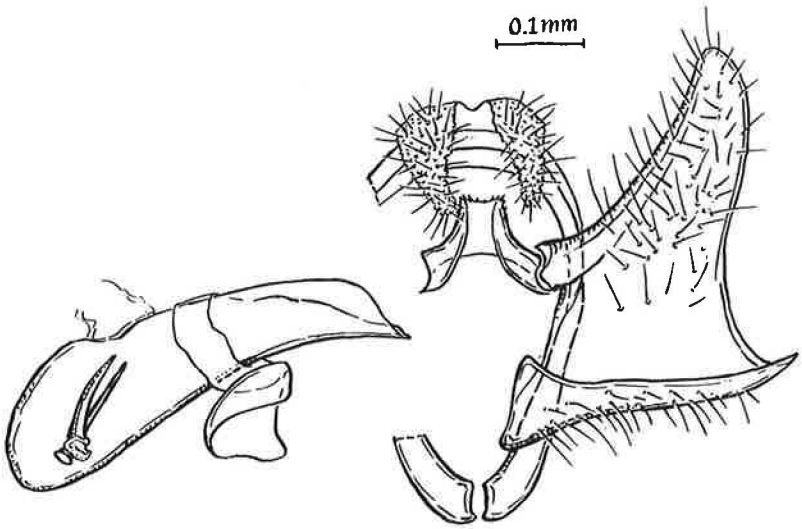

Fig. 3. Male genitalia of *Cochylimorpha arenosana sp. n.* holotype (by V. I. Kuznetsov).

5.VI.1995; Kyzyl 5.–6.VI.1995; lake Ubsu-Nur 15.VI.1995; 7 exx. — Western Palaearctic. New for the fauna of Tuva.

C. richteriana (Fischer v. Rösslerstamm, 1837). — Ust-Uyuk 3.–5.VI.1995 1♂. Near Erzin, sand dunes of Borig-Del (Kostjuk 1975b). — Transpalaearctic.

Aethes moribundana (Staudinger, 1859). — Ust-Uyuk 3.–5.VI.1995; Kyzyl 5.–6.VI.1995; near Erzin 7.–10.VI.1995; Lake Tere-Khol 10.–12.VI.1995; Irbitei River 13.–16.VI.1995; Khol-Oozhu 16.–19.VI.1995; 20 exx. — Mediterranean Central-Asiatic. From the Iberian Peninsula and N-Africa through S-Siberia to Tuva. New for the fauna of Tuva.

A. alatavica (Danilevsky, 1962). — Mugur-Aksy, Khol-Oozhu, Shara-Sur (Kostjuk 1971). — Kazakhstanian- Mongolian.

A. deutschiana (Zetterstedt, 1839). — Mongun-Taiga, Mugur-Aksy, (Kostjuk 1971). — Holarctic, boreomontane.

A. decens Razowski, 1970. — Mongun-Taiga (Razowski 1970, Kostjuk 1971). — The species is known only from the Altai and Tuva.

A. margarotana (Duponchel, 1836). — Tes-Khem River bank near Erzin (Kostjuk 1971). — Western Palaearctic. Possibly a misidentification of the sibling species *A. williana* (Brahm, 1791), reported from Mongolia (Razowski 1970).

Phalonidia minimana (Caradja, 1917). — Tes-Khem River bank near Erzin (Kostjuk 1971 as *P. walsinghamana* Pierce). — Transpalaearctic.

Cochylimorpha asiana (Herrich-Schäffer, 1851). — Lake Ubsu-Nur 15.VI.1995 2 ♂♂. — E-European Central Asiatic. From SE-Europe and Asia Minor in the west eastward to Mongolia and Tuva. New for the fauna of Tuva.

C. cultana (Lederer, 1855). — Khol-Oozhu 16.–19.VI.1995 1 ♂. — Western Palaearctic, from Spain in the west to China and the Altai in the east. New for the fauna of Tuva.

C. nodulana (Möschler, 1862). — Khol-Oozhu (Kostjuk 1971). — Caucasian-Central Asiatic. From lower Volga and Transcaucasia to Iran, Central-Asia, Mongolia and Tuva.

C. perturbatana (Kennel, 1900). — Reported by Kostjuk (1971) from Mugur-Aksy. — East-European-Central Asiatic. Ukraine, southern parts of European Russia, Kazakhstan, Central-Asia, Tuva.

C. fucatana (Snellen, 1883). — Kyzyl 5.–6.VI., 20.VI.1995; Lake Ubsu-Nur 15.VI.1995; Khol-Oozhu 16.–19.VI.1995; 7 exx. — Eastern Palaearctic, from Kazakhstan to the Pacific coast. New for the fauna of Tuva.

C. woliniana (Schleich, 1868) ssp. *luteola* Kuznetsov, 1975. — Lake Ubsu-Nur 15.VI.1995 3 ♂♂. — Western Palaearctic, from W-Europe to Mongolia. The subspecies *luteola* is distributed in the Minussinsk area, Tuva and Mongolia.

C. discolorana (Kennel, 1899). — Near Erzin 7.–11.VI 1995 1 ♂. — E-European-Central Asiatic. SE- and E-Europe, Transcaucasia, Balkan, Asia Minor, Iran, Afganistan. New for the fauna of Tuva.

C. obliquana (Eversmann, 1844). — Kyzyl 5.–6.6., 20.VI.1995; Irbitei River 13.–16.VI.1995; 11 exx. Reported by Kostjuk (1971) from the Uyuk Range, env. Seserlig. — E European-C-Asiatic. Locally distributed in SE Europe,

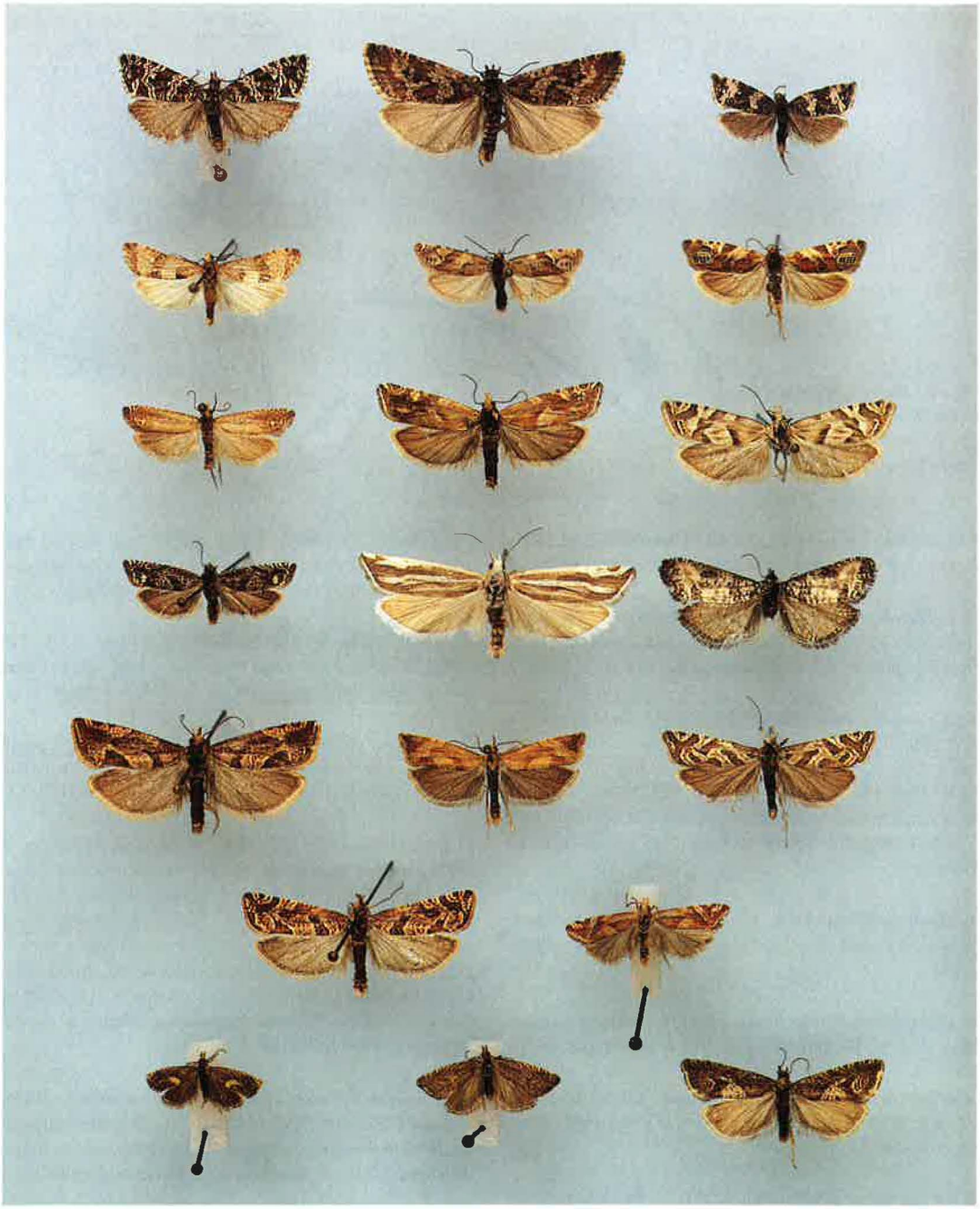

Fig 4. 1st. row: — a. *Rudisociaria expeditana* ♂ (Buryatia); — b. *Phiaris inquietana* ♂ (Polar Ural); — c. *Tia enervana* ♂ (Polar Ural); 2nd. row: — d. *Lobesia subherculeana* ♂ (Tuva); — e. *Eucosma tetraplana* ♂ (Polar Ural); — f. *Eucosma abacana* ♂ (Kazakhstan); 3rd. row: — g. *Eucosma apocrypha* ♂ (Tuva); — h. *Eucosma lignana* ♂ (Tuva); — i. *Eucosma muguraxana* ♂ (Tuva); — 4th. row: — j. *Eucosma paetulana* ♂ (Tuva); — k. *Eucosma argentifera* ♂ (Tuva); — l. *Eucosma lugubrana* ♂ (Tuva); — 5th. row: — m. *Pelochrista chanana* ♂ (Kirgisia); — n. *Pelochrista umbraculana* ♂ (Altai); — o. *Pelochrista arabescana* ♂ (Altai); 6th. row: — p. *Pelochrista danilevskyi* ♂ (Tuva); — q. *Asketria kenteana* ♂ (Buryatia); 7th. row: — r. *Dichrorampha incognitana* ♂ (Altai); — s. *Dichrorampha cinerascens* ♂ (Altai); — t. *Dichrorampha alaicana* ♂ (Kirgisia). Photo E. Roine.

the southern Ural Mnts. and the N-Caucasus.

C. emiliana (Kennel, 1919). — Near Erzin 7.–10.VI.1995; Lake Tere-Khol 10.–12.VI.1995; 6 exx. — E-European-C-Asiatic. Distributed in SE-Europe, the N-Caucasus, Kazakhstan and Mongolia. New for the fauna of Tuva.

C. pyramidana (Staudinger, 1870). — Khol-Oozhu and Mugur-Aksy (Kostjuk 1971). — Locally distributed in the southern Urals, Armenia and Kazakhstan.

C. arenosana Kuznetsov, Jalava & Kullberg, sp.n. — Lake Tere-Khol 10.–12.VI.1995 11 ♂♂. — Known only from the type locality.

Phtheochroa inopiana (Haworth, 1811). — Mugur-Aksy; Tes-Khem River bank near Erzin (Kostjuk 1971). — Holarctic.

P. vulneratana (Zetterstedt, 1839). — Chundurgan (Kostjuk 1971). — Holarctic, boreomontane.

P. pistrinana (Erschoff, 1877). — Khol-Oozhu 16.–19.VI.1995 3 exx. — Eastern Palaearctic, from the Tshu-Ili Mnts. eastward to Japan, Korea and China. New for the fauna of Tuva.

Cnephasiini

Cnephasia nowickii Razowski, 1958. — Khol-Oozhu 16.–19.VI.1995 2 ♂♂. — Previously known from S-Siberia and Mongolia. New for the fauna of Tuva.

Eana argentana (Clerck, 1759). — Uyuk Range, env. of Seserlig; Mugur-Aksy; Chundurgan; Tes-Khem River bank near Erzin (Kostjuk 1971). — Holarctic.

E. osseana (Scopoli, 1763). — Uyuk Range, env. of Seserlig; Khol-Oozhu; Mongun-Taiga; Mugur-Aksy (Kostjuk 1971). — Holarctic, boreomontane.

Amphicoecia adamana (Kennel, 1919). — Mongun-Taiga (Kostjuk 1971). — S-Siberian and Mongolian mountains including the Polar-Ural Mnts. (Jalava & Kullberg, unpubl.).

Xerocnephasia rigana (Sodoffsky, 1829). — Ust-Uyuk 3.–5.VI.1995; Irbitei River 13.–16.VI.1995; Khol-Oozhu 16.–19.VI.1995; 182 km S Kyzyl 6.VI.1995; 14 exx. — Transpalaearctic.

Archipini

Pandemis cerasana (Hübner, 1786). — Khol-Oozhu; Tes-Khem River bank near Erzin (Kostjuk 1971 as *P. ribeana* Hübner, 1799). — Transpalaearctic.

Aphelia viburnana (Denis & Schiffermüller, 1775). — Tes-Khem River bank near Erzin (Kostjuk 1971). — Transpalaearctic.

A. aglossana Kennel, 1899. — Irbitei River 13.–16.VI.1995 common. Previously recorded from Tuva as *Djakonovia accuratana* (Kennel, 1901) from Khol-Oozhu and Mugur-Aksy (Kostjuk 1971). — Kazakhstanian-Mongolian. E-Kazakhstan, S-Siberia (the Altai, the Sayan), Tuva and Mongolia.

A. disjuncta (Filipjev, 1925). — Erzin distr., sand dunes of Borig-Del and Altan-Els (Kostjuk 1971 as *Aneuxanthis disjuncta*). — Kazakhstanian-Mongolian. E-Kazakhstan, S-Siberia from the Altai to the Sayan, Tuva and Mongolia.

Clepsis senecionana (Hübner, 1819). — E-Tannu-Ola 2 175 m. 8.VI., 17.VI.1995; 182 km S Kyzyl 19.VI.1995; common. — Transpalaearctic.

C. rurinana (Linnaeus, 1758). — Uyuk Range, env. Seserlig (Kostjuk 1971 as *C. semialbana* Guenée). — Transpalaearctic.

C. crispinana (Kennel, 1919). — Khol-Oozhu 16.–19.VI.1995, 1 ♂. — The mountains of Altai and Sayan, Tuva and Mongolia.

?*C. rogana* (Guenée, 1845). — Tes-Khem River bank near Erzin (Kostjuk 1971). There is a possibility that Kostjuk misidentified the previous species *C. crispinana*, which is very close to *C. rogana*. — The distribution of *C. rogana* is Transpalaearctic and boreomontane.

C. tannuolana Kostjuk 1973. — Mongun-Taiga Mnts., Munku-Chairhan-Ula; upper flow of Tolaitig River; Eastern shore of Lake Chindiktig-Gol (Kostjuk 1971, 1973). — Siberian: the Altai and the Tannu-Ola Mnts.

C. pallidana (Fabricius, 1776). — Irbitei River 13.–16.VI.1995; Lake Ubsu-Nur 15.VI.1995; common. — Transpalaearctic.

C. aerosana (Lederer, 1853). — Khol-Oozhu 16.–19.VI.1995, 19 exx. — Eastern Palaearctic.

C. danilevskyi Kostjuk, 1973. — Mongun-Taiga Mnts., eastern shore of Lake Chindiktig-Gol (Kostjuk 1971, 1973). — Holarctic, boreomontane. The Polar Urals in the west through Yakutia and Tuva to the Magadan region, Alaska and the Yukon.

C. neglectana (Herrich-Schäffer, 1851). — Samagaltai (Kostjuk 1971). — Western Palaearctic eastward to Tuva.

C. praeclarana (Kennel, 1899). — Irbitei River 13.–16.VI.1995,

1 ♂. — East-European-Central-Asiatic. SW-part of European Russia, N-Caucasus, Kazakhstan, the Altai, Tuva and Mongolia. Previously recorded by Kostjuk (1971) as *Djakonovia praeclarana* ssp. *fucosana* Kennel, 1901.

Choristoneura albaniana (Walker, 1863) (= *lapponana* Tngstr.). — Khol-Oozhu 16.–19.VI.1995, 1 ♂. — Holarctic, boreomontane. New for the fauna of Tuva.

Archips betulanus (Hübner, 1787) — Khol-Oozhu; Tes-Khem River bank near Erzin (Kostjuk 1971, recorded as *A. decretana* Treitschke, 1835). — Transpalaearctic.

Ptycholoma lecheanum (Linnaeus, 1758) ssp. *circumclusanum* (Christoph, 1881). — Uyuk Range, env. Seserlig (Kostjuk 1971b). — Transpalaearctic. The subspecies *circumclusanum* is distributed from the Salair Range eastward to Japan.

Ptycholomoides aeriferanus (Herrich-Schäffer, 1851). — Uyuk Range, env Seserlig; Khol-Oozhu (Kostjuk 1971). — Transpalaearctic, boreomontane. The mountains of C-Europe, the Urals, S-Siberia, Amur, Ussuri and Japan.

Adoxophyes orana (Fischer v. Rösslerstamm, 1834). — E-Tannu-Ola, Ak-Tshira (Kostjuk 1971). — Transpalaearctic.

Capua vulgana (Frölich, 1828) — 182 km S Kyzyl 19.VI.1995, 1 ♂. — Transpalaearctic.

Philedone gerningana (Denis & Schiffermüller, 1775). — Uyuk Range, env. Seserlig (Kostjuk 1971). — Transpalaearctic.

Tortricini

Croesia bergmanniana (Linnaeus, 1758). — Uyuk Range, env. Seserlig; Chorumnug-Taiga Range, 50 km E of Samagaltai (Kostjuk 1971). — Holarctic.

Acleris emargana (Fabricius, 1775). — Kyzyl; Chorumnug-Taiga (Kostjuk 1971). — Holarctic.

A. idonea Razowski, 1972. — Ust-Uyuk 3.–5.VI.1995; near Erzin 7.–10.VI.1995; 3 exx. Until now known only from Mongolia. New for the fauna of Tuva and Russia. The adult and the genitalia of both sexes are figured by Razowski (1984).

Bactrini

Bactra lacteana (Caradja, 1916). — Chundurgan (Kostjuk 1971). — Transpalaearctic.

B. furfurana (Haworth, 1811). — Near Erzin 7.–10.VI.1995; Lake Tere-Khol 10.–12.VI.1995; Lake Ubsu-Nur 15.VI.1995; 4 exx. — Holarctic.

B. robustana (Christoph, 1872). — Tes-Khem River bank near Erzin (Kostjuk 1971). — Transpalaearctic.

Olethreutini

Aterpia sieversiana (Nolcken, 1870) ssp. *quadrimaculana* (Snellen, 1883). — Tes-Khem River bank near Erzin (Kostjuk 1971). — Transpalaearctic. The subspecies *quadrimaculana* is distributed in SE-Siberia, the Amur area and Mongolia.

Apotomis capreana (Hübner, 1817). — Tes-Khem River bank near Erzin (Kostjuk 1971). — Holarctic.

A. semifasciana (Haworth, 1811). — Sagan-Shibetu Range, lower flow of Mugur River; Khol-Oozhu; Shara-Sur on the lower flow of Tes-Khem River; Tes-Khem River bank near Erzin (Kostjuk 1971). — Transpalaearctic.

A. sororculana (Zetterstedt, 1839). — Khol-Oozhu; Tes-Khem River bank near Erzin (Kostjuk 1971). — Transpalaearctic.

Orthotaenia undulana (Denis & Schiffermüller, 1775). — Tes-Khem River bank near Erzin (Kostjuk 1971). — Holarctic.

Hedya salicella (Linnaeus, 1758). — Khol-Oozhu (Kostjuk 1971). — Transpalaearctic.

H. ochroleucana (Frölich, 1828). — Uyuk Range, env. of Seserlig (Kostjuk 1971). — Holarctic.

Celypha rufana (Scopoli, 1763). — River banks of Tes-Khem (Kostjuk 1971). — Western Palaearctic, eastwards to the Baikal area.

C. cespitana (Hübner, 1817). — Khol-Oozhu; Tes-Khem River bank near Erzin (Kostjuk 1971). — Holarctic.

C. flavipalpana (Herrich-Schäffer, 1851). — Khol-Oozhu; Shara-Sur on lower flow of Tes-Khem River (Kostjuk 1971). — Transpalaearctic.

Rudisociaria expeditana (Snellen, 1883). — Ust-Uyuk 3.–5.VI.1995; Kyzyl 5.–6.VI.1995; near Erzin 7.–10.VI.1995; Lake Tere-Khol 10.–12.VI.1995; Khol-Oozhu 16.–19.VI.1995; abundant. — Eastern Palaearctic: from SE-Europe to the Pacific coast.

Tia enervana (Erschoff, 1877). — Chundurgan (Kostjuk

1971). — Holarctic: from the Polar Urals to North America.

Capricornia boisduvaliana (Duponchel, 1836). — Tes-Khem River bank near Erzin (Kostjuk 1971). — Transpalaearctic.

Phiaris bipunctana (Fabricius, 1794). — Chundurgan (Kostjuk 1971). — Western Palaearctic.

P. stibiana (Guenée, 1845). — Kyzyl 5.–6.VI.1995; Khol-Oozhu 16.–19.VI.1995; 5 exx. Uyuk Range, env. of Seserlig; Mugur-Aksy; Tes-Khem River bank near Erzin (Kostjuk 1971). — Western Palaearctic.

P. obsoletana (Zetterstedt, 1839). — Uyuk Range, env. Seserlig; Khol-Oozhu; Mongun-Taiga; Mugur-Aksy; Chundurgan (Kostjuk 1971). — Transpalaearctic.

P. tiedemanniana (Zeller, 1845). — Mugur-Aksy (Kostjuk 1971). — Transpalaearctic.

P. metallicana (Hübner, 1799). — E-Tannu-Ola, Shurmak pass (Kostjuk 1971). — Transpalaearctic.

P. inquietana (Walker, 1863) ssp. *hepialana* Kennel, 1900. — Mongun-Taiga (Kostjuk 1971). — Holarctic, from the Polar Urals and S-Siberian mountains to Northern Greenland, arctoalpine. The subspecies *hepialana* is distributed in Mongolia and Tuva.

Syricoris lacunana (Denis & Schiffermüller, 1775). — Chorumnug-Taiga; Chundurgan (Kostjuk 1971). — Transpalaearctic.

S. rivulana (Scopoli, 1763). — Uyuk Range, env. Seserlig; Mugur-Aksy (Kostjuk 1971). — Transpalaearctic.

Lobesiini

Lobesia subherculeana Filipjev, 1924. — Kyzyl 5.–6.VI.1995; Irbitei River, 13.–16.VI.1995; 3 exx. — Previously known only from S Siberia, near Minussinsk. New for the fauna of Tuva.

Endotheniini

Endothenia gentianaeana (Hübner, 1825). — Kyzyl 5.–6.VI.1995, 1 ♀; Khol-Oozhu; Mugur-Aksy; Tes-Khem River bank near Erzin (Kostjuk 1971). — Transpalaearctic.

E. nigricostana (Haworth, 1811). — Uyuk Range, env. Seserlig (Kostjuk 1971). — Transpalaearctic.

E. quadrimaculana (Haworth, 1811). — Uyuk Range, env. Seserlig; Mugur-Aksy; Khol-Oozhu; Tes-Khem River bank near Erzin (Kostjuk 1971). — Transpalaearctic.

Enarmoniini

Ancylis comptana (Frölich, 1828). — E-Tannu-Ola 2 175 m. 17.VI.1995 abundant. New for the fauna of Tuva. — Holarctic.

A. kenneli Kuznetsov, 1962. — Near Erzin 7.–10.VI.1995 2 exx. — Transpalaearctic but local. In Europe only from the Baltic countries and Finland. In Asia distributed from the S-Ural Mnts. to the Pacific coast.

A. geminana (Donovan, 1806). — Tes-Khem River bank near Erzin (Kostjuk 1971). — Transpalaearctic.

A. unguicella (Linnaeus, 1758). — Tes-Khem River bank near Erzin (Kostjuk 1971). — Holarctic.

A. tineana (Hübner, 1799). — Tes-Khem River bank near Erzin (Kostjuk 1971). — Holarctic.

A. badiana (Denis & Schiffermüller, 1775). — E-Tannu-Ola 2175 m. 17.VI.1995 1 ♂. E-Tannu-Ola Mnts., Shurmak pass (Kostjuk 1971). — Transpalaearctic.

A. myrtillana (Treitschke, 1830). — Mugur-Aksy (Kostjuk 1971). — Transpalaearctic.

Eucosmini

Gibberifera simplana (Fischer v. Röslerstamm, 1835). — Khol-Oozhu 16.–19.VI.1995 1 ♂. — Transpalaearctic.

Zeiraphera griseana (Hübner, 1799). — Uyuk Range, env. Seserlig; Mugur-Aksy; Chorumnug-Taiga; Tes-Khem River bank near Erzin (Kostjuk 1975b). — Transpalaearctic.

Gypsonoma nitidulana (Zeller, 1846). — Tes-Khem River bank near Erzin (Kostjuk 1975b). — Transpalaearctic.

G. sociana (Haworth, 1811). — Tes-Khem River bank near Erzin (Kostjuk 1975b). — Transpalaearctic.

G. minutana (Hübner, 1799). — E-Tannu-Ola, Ak-Tshira (Kostjuk 1975b). — Transpalaearctic.

Retinia perangustana (Snellen, 1883). — Tes-Khem River bank near Erzin; sand dunes Borig-Del near Erzin (Kostjuk 1975b). — Recorded from Europe sporadically from Sweden, Poland, France, Slovakia, the Czech republik and Or-

lovskaja obl. (south of Moscow). The distribution area in Asia is from the Urals to Kamchatka, Amur-Ussuri area and China.

Epinotia contrariana (Christoph, 1881). — Uyuk Range, env. Seserlig (Kostjuk 1975b). — Eastern Palaearctic, from the Altai to Japan.

E. bilunana (Haworth, 1811). — Tes-Khem River bank near Erzin (Kostjuk 1975b). — Transpalaearctic.

E. demarniana (Fischer v. Röslerstamm, 1840). — Tes-Khem River bank near Erzin (Kostjuk 1975b). — Transpalaearctic.

E. nisella (Clerck, 1759). — Tes-Khem River bank near Erzin (Kostjuk 1975b). — Holarctic.

E. solandriana (Linnaeus, 1758). — Samagaltai (Kostjuk 1975b). — Holarctic.

E. caprana (Fabricius, 1798). — Mugur-Aksy (Kostjuk 1975b). — Transpalaearctic.

Notocelia incarnatana (Hübner, 1800). — Uyuk Range, env. Seserlig; Samagaltai (Kostjuk 1975b). — Transpalaearctic.

N. cynosbatella (Linnaeus, 1758). — Uyuk Range, env. Seserlig; Khol-Oozhu (Kostjuk 1975b). — Transpalaearctic.

Epiblema foenellum (Linnaeus, 1758). — Uyuk Range, env. Seserlig (Kostjuk 1975b). — Transpalaearctic, including N-India.

E. graphanum (Treitschke, 1835). — Tes-Khem River bank near Erzin (Kostjuk 1975b). — Transpalaearctic.

Eucosma tetraplana (Möschler, 1866). — E-Tannu-Ola 2 175 m. 17.VI.1995 3 exx. — Eastern Palaearctic. Widely but locally distributed: Asia Minor, Iran, Kazakhstan, the Polar Urals, S-Siberia from Volga eastward to Mongolia and the Amur area. Recorded by Kostjuk (1975b) as *E. oculatana* (Kennel, 1900).

E. abacana (Erschoff, 1877). — Uyuk Range, env. Seserlig; Khol-Oozhu (Kostjuk 1975b). — Eastern Palaearctic.

E. pergratana (Rebel, 1914). — Mugur-Aksy (Kostjuk 1975b). — Kazakshtanian-Mongolian. The species is distributed in Kazakhstan, Kyrgyzstan, Tuva, Mongolia and NW-China.

E. apocrypha Falkovich, 1964. — Ust-Uyuk 3.–5.VI.1995; Kyzyl 5.–6.VI.1995; Lake Tere-Khol 10.–12.VI.1995; Irbitei River 13.–16.VI.1995; Lake Ubsu-Nur 15.VI.1995; Khol-Oozhu 16.–19.VI.1995; 20 exx. — Eastern Palaearctic, e.g., Kazakhstan, Kyrgyzstan, the Altai and Tuva.

E. lignana (Snellen, 1883). — Irbitei River 13.–16.VI.1995, 1 ♂. — Eastern Palaearctic. Kazakhstan, S-Siberia, Yakutia, Tuva and Mongolia.

E. muguraxana Kostjuk, 1975. — Irbitei River 13.–16.VI.1995, 3 exx. Uyuk Range, env. Seserlig; Mugur-Aksy (Kostjuk 1975a, 1975b). — An endemic of Mongolia and Tuva. *E. muguraxana* Kostjuk is possibly a younger synonym of *E. metana* (Kennel, 1919), described from Changai, China.

E. aspidiscana (Hübner, 1817). — Ust-Uyuk 3.–5.VI.1995; E-Tannu-Ola 2175 m. 17.VI.1995; 6 exx. — Transpalaearctic.

E. aurantiradix Kuznetsov, 1962. — Sand dunes of Borig-Del near Erzin (Kostjuk 1975b). — Eastern Palaearctic.

E. decolorana (Freyer, 1840). — Tes-Khem River bank near Erzin (Kostjuk 1975b). — Transpalaearctic.

E. aemulana (Schläger, 1849). — Mugur-Aksy; Tes-Khem River bank near Erzin (Kostjuk 1975b). — Transpalaearctic.

E. brigittana (Kennel, 1919). — Tannu-Ola (Kennel, 1919). Recorded only from Tuva. Possibly a younger synonym of *E. tundrana* (Kennel, 1900), which is a transsiberian common species.

E. paetulana (Kennel, 1900) ssp. *mirana* (Caradja, 1916). — Ust-Uyuk 3.–5.VI.1995; Kyzyl 5.–6.VI.1995; near Erzin 7.–10.VI.1995; Lake Ubsu-Nur 15.VI.1995; Khol-Oozhu 16.–19.VI.1995; 48 exx. — Eastern Palaearctic. From Bashkiria (Transural) and S-Ural Mnts. in the west eastwards to the Amur area on the Pacific coast. The subspecies *mirana* is distributed in S-Siberia. New for the fauna of Tuva.

E. lacteana (Treitschke, 1835). — Erzin distr., sand dunes of Altan-Els and Borig-Del; Shara-Sur; Tes-Khem River bank (Kostjuk 1975b). — Transpalaearctic.

E. argentifera Razowski, 1972. — Near Erzin 7.–10.VI.1995; Lake Tere-Khol 10.–12.VI.1995; 40 exx. — Previously known only from Mongolia. New for the fauna of Tuva and Russia.

E. lugubrana (Treitschke, 1830). — Ust-Uyuk 3.–5.VI.1995, 1 ♂. — Western Palaearctic. Previously known locally from W-Europe and Kazakhstan. New for the fauna of Tuva.

Pelochrista chanana (Staudinger, 1900). — Uyuk Range, env. Seserlig; lower flow of the river Tes-Khem; Shara-Sur (Kostjuk 1975b). — Kazakhstanian - Mongolian.

P. jodocana (Kennel, 1919). — Tannu-Ola (Kennel, 1919). — Known only from Tuva and Mongolia.

P. umbraculana (Eversmann, 1844). — Uyuk Range, env. Seserlig; Khol-Oozhu; Mugur-Aksy; River bank of Tes-Khem near Erzin (Kostjuk 1975b). — Eastern Palaearctic.

P. tholera Falkovich, 1964. — Mugur-Aksy (Kostjuk 1975b). — Kazakhstanian-Mongolian.

P. arabescana (Eversmann, 1844) ssp. *ornamentana* (Rebel, 1917). — Khol-Oozhu; Mugur-Aksy; Tes-Khem River bank near Erzin (Kostjuk 1975b). — East-European-Central-Asiatic, the steppe zone from Ukraine to S-Siberia and Mongolia. The subspecies *ornamentana* is distributed in Tuva and Mongolia.

P. disquei (Kennel, 1901). — Mugur-Aksy (Kostjuk 1975b). — This species is recorded from the the Sayan Mnts., Buryatia, Tuva and Mongolia.

P. danilevskyi Kostjuk, 1975. — Near Erzin 7.–10.VI.1995 9 exx. W-Tannu-Ola, Ovjurskiy distr.; Mugur-Aksy, (Kostjuk 1975a, 1975b). — The species is known only from Tuva and Mongolia.

Asketria kenteana (Staudinger, 1892). — Mugur-Aksy (Kostjuk 1975b). — Eastern Palaearctic. Transbaikal, Tuva, Mongolia, Magadan area, the Amur area and N-China.

Eriopsela quadrana (Hübner, 1813). — Mugur-Aksy (Kostjuk 1975b). — Transpalaearctic.

E. mongunana Kostjuk, 1973. — Mongun-Taiga (Kostjuk 1973, 1975b). — Known only from Tuva.

Grapholithini

Dichrorampha plumbana (Scopoli, 1763). — Mongun-Taiga (Kostjuk 1975b). — Transpalaearctic.

D. incognitana (Kremky & Maslowski, 1933). — Mongun-Taiga (Kostjuk 1975b). — Transpalaearctic.

D. gueneeana Obraztsov, 1953. — Uyuk Range, env. Seserlig (Kostjuk 1975b). — Transpalaearctic.

D. petiverella (Linnaeus, 1758). — Uyuk Range, env. Seserlig (Kostjuk 1975b). — Transpalaearctic.

D. cinerascens (Danilevsky, 1948). — Mongun-Taiga; Uyuk Range, env. of Seserlig; Chundurgan; Tes-Khem River bank near Erzin (Kostjuk 1975b). — Western Palaearctic, eastward to the Altai and Tuva.

D. alaicana (Rebel, 1910). — Uyuk Range, env. Seserlig; Mongun-Taiga; Mugur-Aksy; Khol-Oozhu (Kostjuk 1975b). — The species is distributed in the mountains of Central Asia, Mongolia and China.

Cydia medicaginis (Kuznetsov, 1962). — E-Tannu-Ola 2175 m. 17.VI.1995 1 ♂. — Western Palaearctic. New for the fauna of Tuva.

C. nigricana (Fabricius, 1794) ssp. *asiatica* (Kuznetsov, 1968). — Khol-Oozhu; Tes-Khem River bank near Erzin (Kostjuk 1975b). — Holarctic. The subspecies *asiatica* is known from E-Asia.

C. oxytropidis (Martini, 1912). — 182 km S Kyzyl 6.VI., 19.VI.1995, 4 exx.; Shara-Sur on the lower flow of Tes-Khem River (Kostjuk 1971). — Transpalaearctic.

C. populana (Busck, 1916) ssp. *seductana* (Kuznetsov, 1962). — Tes-Khem River bank near Erzin (Kostjuk 1975b). — Holarctic. The subspecies *seductana* is known only from E-Asia.

Grapholita jungiella (Clerck, 1759). Ust-Uyuk 3.–5.VI.1995 common. — Transpalaearctic. New for the fauna of Tuva.

G. pallifrontana (Zeller, 1849). — 182 km S Kyzyl 6.VI.1995, 1 ♂. — Transpalaearctic. New for the fauna of Tuva.

G. caecana (Schläger, 1847). — Ust-Uyuk 3.–5.VI.1995; Irbitei River 13.–16.VI.1995; Lake Ubsu-Nur 15.VI.1995; 4 exx. — Transpalaearctic.

G. orobana (Treitschke, 1830). — E-Tannu-Ola 1 000–2 000 m., 17.VI.1995, 1 ♂. — Transpalaearctic.

5. Zoogeographical discussion

Altogether 145 species of Tortricidae are recorded from the western part of Tuva. Kuznetsov and al. (1996) report 165 species from the Western Tian-Shan (the Transili-Alatau). Falkovich (1970) lists 202 species from the Kuznetskiy Ala-Tau. Although the Tuva area is so far poorly examined, we can suggest a zoogeographical comparison between the Tortricid faunas of W-Tian-Shan and W-Tuva. For this comparison we used 138 species of the Tuvian fauna — the distribution areas of the remaining seven species are still too poorly known.

Both Tuvian and Tian-Shanian Tortricid faunas can be divided into three different zoogeogra-

phic complexes: A. Holarctic/Palaearctic boreal/temperate species; B. Mediterranean/Central Asiatic semidesert and steppe species; C. Central Asiatic endemic mountain species (see Table 1).

A. The Tortricid fauna of Western Tuva consists mainly of Holarctic/Transpalaearctic species. Of the 145 species recorded from the area 86 (about 65%) are Transpalaearctic or Holarctic. 25 species (about 17%) are Western or Eastern Palaearctic. The number of Holarctic species in western Tuva is only 22 from 145 (15.2%). In northeastern Siberia (the Magadan-Chukotka area) the corresponding figures are 26 out of the total of 68 species (38.2%) (Kuznetsov & Mikkola 1991).

Practically all species of this Holarctic/Palaearctic complex in Tuva (with the exception of some eastern or western Palaearctic steppe species) are associated with the larch-taiga zone with *Larix, Populus, Salix, Alnus* and *Betula.* Some species are associated with the meadow vegetation of river valleys and banks, e.g. along Tes-Khem. On the higher slopes of the Mongun-Taiga and the Tannu-Ola Mnts. the subalpine and alpine meadows and mountain tundras are inhabited by some boreomontane and arctoalpine Holarctic species, e.g., *Aethes deutschiana, Phtheochroa vulneratana, Eana osseana, Clepsis danilevskyi* and *Phiaris inquietana.*

B. All the species of the Mediterranean-Central-Asiatic complex inhabit the steppe landscapes of the Turanian lowlands or the lower steppe slopes of the mountain ranges. This distribution type is very rare in Western Tuva and is represented only by few species from four different chorological groups: Mediterranean/ Central-Asiatic: *Aethes moribundana;* East-European/Central-Asiatic: *Cochylimorpha perturbatana, C. discolorana, C. asiana, C. obliquana, C. emiliana, C. pyramidana, Clepsis praeclarana* and *Pelochrista arabescana;* Caucasian/ Central-Asiatic: *Cochylimorpha nodulana* and Kazakhstanian-Mongolian: *Aethes alatavica, Aphelia aglossana, A. disjuncta, Pelochrista tholera, P. chanana* and *Eucosma pergratana.*

C. Eleven species are endemic for the Central-Asiatic mountains. They form the Tuvian-Mongolian distribution type, which differs from the similar Kazakhstanian-Mongolian type by having very narrow ecological and zoogeographical ranges. Their larvae feed probably on endemic mountain plants, e.g. *Pelochrista danilevskyi* is monophagous on *Artemisia frigida* (Kostjuk 1971). This endemic group can be divided into two different parts. Some species, e.g., *Clepsis crispinana, Acleris idonea* and *Eriopsela monguna* are close relatives to some Transpalaearctic species *(Clepsis rogana, Acleris hastiana* and *Eriopsela quadrana)* of the complex A. The remaining species, *Aethes decens, Clepsis tannuolana, Pelochrista disquei, P. danilevskyi, P. jodocana, Eucosma argentifera, E. muguraxana* and *Falseuncaria lechriotoma* may be remnants of the Mediterranean-Central-Asiatic complex. Some of them are very close to certain Central-Asiatic con-

Table 1. The number of species and percentage of the main zoogeographical complexes (A–C) and chorological groups (1–10).

	Tian-Shan spp.	%	W-Tuva spp.	%
A. Holarctic/Palaearctic	91	39	112	83
1. Holarctic	16	10	22	17
2. Transpalaearctic	40	24	64	48
3. Western Palaearctic	32	19	12	09
4. Eastern Palaearctic	3	02	13	10
B. Mediterranean-Central-Asiatic	32	21	15	10
5. Mediterranean-Cenral-Asiatic	3	02	1	01
6. East-European-Central-Asiatic	14	09	7	05
7. Caucasian-Central-Asiatic	5	03	1	01
8. Iranian-Central-Asiatic	4	03	–	–
9. Kazakstanian-Mongolian	6	04	6	05
C. Central-Asiatic mountain endemic	32	21	11	08
10.Tian-Shanian[1] or Tuvian-Mongolian[2]	32[1]	21	11[2]	08
D. Species with poorly known distributions	10		7	

generics. Some western Palaearctic steppe species are represented in the Tuvian highlands by Central-Asiatic subspecies, e.g. *Cochylimorpha woliniana* ssp. *luteola*. In western Tuva the endemic species or subspecies occur mainly in the steppe highlands and on southern steppe slopes and subalpine meadows of the Mongun-Taiga Mnts., the Sagan-Shibetu Range and the Tannu-Ola Mnts. Usually their distribution area extends to the mountain systems of Mongolia, sometimes also to the Altai, the Sayan and to the numerous mountain ranges of Buryatia.

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References

Danilevsky, A. S. & Kuznetsov, V. I. 1968: [Tribe Laspeyresiini (Tortricidae).] — Fauna of the USSR, ser. 98, Insecta, Lepidoptera. Vol. 5, fasc. 1. Nauka, Leningrad. 539 pp. [In Russian].

Falkovitsh, M. I. 1970: [Leaf-rollers (Lepidoptera, Tortricidae) of the foothills of Kuznetskiy Alatau.] — In: Cherepanov, A. A. (ed.), The Fauna of Siberia: 222–274. [In Russian].

Hodges, R. W. (ed.) 1983: Check-list of the Lepidoptera of America North of Mexico. — London. 308 pp.

Karsholt, O. & Razowski, J. (eds.) 1996: The Lepidoptera of Europe. A Distributional Checklist. — Apollo Books. 380 pp.

Kennel, J. 1919: Mittelasiatische und andere neue Tortriciden. — Mitt. Münchener Entomol. Ges. Bd. 8, (11–12): 50–95.

Kostjuk, Ju. A. 1971: [On studying of Lepidoptera from Tuva and North-Western Mongolia. Tortricoidea. Communication I (On the materials of the I and II Central Asian expeditions of the Zoological Museum of the Academy of Sciences of the Ukrainian SSR in 1968).] — Sbirnik prac Zool. Mus. Acad. Nauk. Ukrainsk. RSR, Kiew, 34: 38–50. [In Ukrainian].

Kostjuk, Ju. A. 1973: [New species of leaf-rollers (Lepidoptera, Tortricidae) from mountains of Central Asia.] — Tr. Vses. Entomol. O-vo vol. 56: 162–168. [In Russian].

Kostjuk, Ju. A. 1975a: [New species of leaf-rollers (Lepidoptera, Tortricidae) from the highlands of the Palaearctic.] — Vest. Zool., Kiew, 2: 59–65. [In Russian].

Kostjuk, Ju. A. 1975b: [On studying Lepidoptera from Tuva and North Western Mongolia. Tortricoidea, contribution II.] — Insects of Mongolia 3: 395–407. [In Russian].

Kuznetsov, V. I. 1973: [Leaf-rollers (Lepidoptera, Tortricidae) of the Soviet Far East and their seasonal cycles.] — In: Kryzhanovskij, O. L. (ed.), Lepidopterous fauna of the USSR and adjacent countries. Tr. Vses. Entomol. O-vo 56: 44–161, Leningrad. [In Russian].

Kuznetsov, V. I. 1975: [On the fauna of leaf-rollers (Lepidoptera, Tortricidae) of Mongolia.] — Insects of Mongolia 3: 408–437. [In Russian].

Kuznetsov, V. I. 1978: [Family Tortricidae (Olethreutidae, Cochylidae), leaf-rollers.] — In: Medvedev, G. S. (ed.), Key for determination of insects of the European part of USSR. Vol. 4, Lepidoptera, part 1: 193–680. Nauka, Leningrad 711 p. [In Russian].

Kuznetsov, V. I. & Jalava, J. 1988: Soviet-Finnish expeditions to Southern Siberia 1982–1984. 2. Tortricidae (Lepidoptera). — Nota Lepidopterol. 11: 126–138.

Kuznetsov, V. I. & Mikkola, K. 1991: The leaf-roller fauna of North-Eastern Siberia, USSR, with descriptions of three new species (Lepidoptera, Tortricidae). — Nota Lepidopterol. 14: 194–219.

Kuznetsov, V. I., Kaila, L. & Mikkola, K. 1996: The leaf-rollers (Lepidoptera, Tortricidae) of the western Tian-Shan Mountains in Kazakhstan and Kyrgyzstan, with description of a new species. — Acta Zool. Fennica 200: 41–55.

Razowski, J. 1966: Tortricoidea (Lepidoptera) from Mongolia. — Ann. Zool. (Warszawa) 43: 495–507.

Razowski, J. 1970: Cochylidae. — In: Amsel, H. G., Gregor, F., & Reisser, H. (eds.), Microlepidoptera Palaearctica Bd. 3. 528 pp.

Razowski, J. 1972: The results of Dr. Z. Kaszab's Zoological Expeditions to Mongolia nr. 273, Tortricidae and Cochylidae (Lepidoptera). — Acta Zool. Cracov. 17: 131–161.

Razowski, J. 1979: Revision of the Genus Clepsis Guenée (Lepidoptera, Tortricidae). Part I. — Acta Zool. Cracov. 23: 101–198.

Razowski, J. 1984: Tortricini. — In: Amsel, H. G., Gregor, F. & Reisser, H. (eds.), Microlepidoptera Palaearctica Bd. 6. 376 pp.

Rebel, H. 1917 (1916): Ueber eine Mikrolepidopterenausbeute aus dem Östlichen Tannuola gebiet. — Iris, Jahrg. 30: 186–195.