



ZOOTAXA

5218

Taxonomy and faunistics of the genus *Scrobipalpa* Janse, 1951 (Lepidoptera, Gelechiidae) in southern Siberia

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Magnolia Press
Auckland, New Zealand

OLEKSIY BIDZILYA, PETER HUEMER & JAN ŠUMPICH
**TAXONOMY AND FAUNISTICS OF THE GENUS *SCROBIPALPA* JANSE, 1951 (LEPIDOPTERA,
GELECHIIDAE) IN SOUTHERN SIBERIA**
(*ZOOTAXA* 5218)

76 pp.; 30 cm.

6 Dec. 2022

ISBN 978-1-77688-650-0 (paperback)

ISBN 978-1-77688-651-7 (Online edition)

FIRST PUBLISHED IN 2022 BY

Magnolia Press

P.O. Box 41-383

Auckland 1041

New Zealand

e-mail: magnolia@mapress.com

<https://www.mapress.com/zt>

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ISSN 1175-5326 (Print edition)

ISSN 1175-5334 (Online edition)

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Abstract

Thirteen new species of *Scrobipalpa* Janse, 1951 are described: *S. nupponeni* sp. nov. (Russia: Buryatia, Altai), *S. rutjani* sp. nov. (Kyrgyzstan; Russia: Novosibirsk reg., Tuva), *S. tannuoella* sp. nov. (Russia: Tuva), *S. kullbergi* sp. nov. (Russia: Tuva), *S. lobata* sp. nov. (Russia: southern Ural, Altai, Tuva, Buryatia), *S. inexplicitata* sp. nov. (Russia: Altai; Armenia), *S. altubura* sp. nov. (Russia: Altai, Tuva, Buryatia), *S. krasnogorka* sp. nov. (Russia: Altai), *S. buryatica* sp. nov. (Russia: Buryatia), *S. albiflava* sp. nov. (Russia: Altai, Tuva), *S. ravidata* sp. nov. (Russia: Buryatia, Zabaikalskiy krai), *S. ochronerva* sp. nov. (Russia: Buryatia) and *S. ochraeata* sp. nov. (Russia: Zabaikalskiy krai). Four new generic combinations are proposed: *Scrobipalpa saxatilis* (Povolný, 1996) comb. nov.; *Scrobipalpa truncata* (Povolný, 2002) comb. nov.; *Scrobipalpa superba* (Povolný, 1996) comb. nov. and *Scrobipalpa cinerea* (Povolný, 1996) comb. nov. Five new synonyms are established: *S. punctata* (Povolný, 1996) syn. nov. of *S. zaitzevi* Piskunov, 1990; *S. abstrusa* Huemer & Karsholt, 2010 syn. nov. of *S. truncata* (Povolný, 2002); *S. pinosa* (Povolný, 2001) syn. nov. of *S. ferruginosa* (Povolný, 2001); *S. kyrana* (Povolný, 2001) syn. nov. of *S. similis* Povolný, 1973 and *S. zouhari* Povolný, 1984 syn. nov. of *S. rebeli* (Priessecker, 1915). *Scrobipalpa sibirica* Bidzilya, 2009 sp. rev., stat. nov. is taken out from synonymy with *S. occulta* (Povolný, 2002) and *S. japonica* Povolný, 1977 sp. rev., stat. nov. is taken out from synonymy with *S. rebeli* (Priessecker, 1914). Six species are recorded from Russia for the first time: *Scrobipalpa superstes* Povolný, 1977; *S. punctulata* Li & Bidzilya, 2019; *S. strictella* Bidzilya & Li, 2010; *S. inferna* Povolný, 1973; *S. mongolica* Povolný, 1969 and *S. mixta* Huemer & Karsholt, 2010. *Scrobipalpa notata* (Povolný, 2001) is new for Armenia, *S. frugifera* Povolný, 1969 and *S. mixta* are new for Kazakhstan, *S. acuta* (Povolný, 2001) and *S. ferruginosa* are new for Mongolia, *S. tenebrata* (Povolný, 2001) is new for China, *S. zaitzevi* is new for Tajikistan and Afghanistan, *S. truncata* is new for Kyrgyzstan and Mongolia, *S. marmorella* Povolný, 1969 and *S. candicans* (Povolný, 1996) are new for Tajikistan. The male genitalia of *S. ferruginosa*, and the female genitalia of *S. bidzilyai* (Povolný, 2001), *S. chitensis* (Povolný, 2001), *S. tenebrata*, *S. cinerosella* Bidzilya, 2009 and *S. japonica* are described for the first time. Improved diagnosis and additions to descriptions are provided for some little known and poorly diagnosed species. Adults and genitalia are illustrated for all new species and for most of the species which represent new faunistic records.

Key words. Distribution, DNA barcoding, new combinations, new synonyms, new records, new species, systematics.

Introduction

Scrobipalpa with about 300 Palaearctic (Povolný 2002; Huemer & Karsholt 2020; Bidzilya 2021), ten Nearctic (Lee *et al.* 2009), thirty-six Afrotropical (Bidzilya 2021) and five Australian species (Povolný 1977a) is the most diverse genus of the tribe Gnorimoschemini and also one of the most diverse genera in the family Gelechiidae. The Palaearctic species were studied intensively by Povolný, who contributed tremendously to the taxonomy and diversity of the genus (Povolný 1966, 1967, 1968, 1969, 2002, and others). More recently the European *Scrobipalpa* were revised (Huemer & Karsholt 2020). Probably incomplete lists exist for China (Bidzilya & Li 2010; Li & Bidzilya 2019), the Kyzylkum desert of Uzbekistan (Falkovitsh & Bidzilya 2009), Israel (Bidzilya *et al.* 2019b), Mongolia (Povolný 1969, 1973; Emelyanov & Piskunov 1982; Lvovsky & Piskunov 1989; Piskunov 1990) and several other countries or regions (Povolný 1971, 1972, 1977c, and others).

Scrobipalpa from southern Siberia (Russia) was partially studied as an integrative part of other Gelechiidae from this region. Since 1998, a series of papers devoted to the Gelechiidae of Transbaikalia, Altai Mountains and other regions have been published (Bidzilya *et al.* 1998, 2002; Povolný 2001; Bidzilya 2000, 2002, 2005, 2009; Bidzilya & Nupponen 2018; Bidzilya *et al.* 2019a; Šumpich *et al.* 2020). These data have been incorporated in the first and second editions of the “Catalogue of Lepidoptera of Russia” (Ponomarenko 2008, 2019) and, partially, in the “Annotated catalogue of the insects of Russian Far East” (Ponomarenko 2016).

Scrobipalpa species are most diverse in the open arid landscapes of the Palaearctic region. They are the dominant gelechiids in halophytic habitats, dry mountains steppes, deserts, and semideserts. The genus is distributed from sea level (coastal dunes) to about 4000 m in the mountains of Central Asia.

This contribution aims to describe 13 new species from different regions of southern Siberia, to clarify the taxonomic state of some species, correct some previous records and add several new country records. The description of new species is supported morphologically and, for the majority, confirmed by DNA barcodes (mtCOI gene).

Material and methods

Adults were collected by light trapping or by hand netting. Male and female genitalia were dissected and prepared using standard methods (Huemer & Karsholt 1999). In some cases, previously dissected genitalia were remounted from the original slide mounts using the unrolling technique.

Tissue samples (dried legs) of 365 specimens of *Scrobipalpa* were prepared according to the prescribed standards to obtain DNA barcode sequences of the mitochondrial COI gene (cytochrome c oxidase 1) and processed at the Canadian Centre for DNA Barcoding (CCDB, Biodiversity Institute of Ontario, University of Guelph) using the standard high-throughput protocol (deWaard *et al.* 2008). We furthermore analysed 338 supplementary sequences of *Scrobipalpa* from BOLD with sequences > 500 bp. Details including complete voucher data and images can be accessed in the public dataset "DS-SCROBSIB *Scrobipalpa* of Siberia" in the Barcode of Life Data Systems (BOLD; Ratnasingham & Hebert 2007). Sequences were assigned to the Barcode Index Numbers (BINs), algorithm-based operational taxonomic units that provide an accurate proxy for the true species (Ratnasingham & Hebert 2013). BINs were automatically calculated for records in BOLD that are compliant with the DNA Barcode standard. All sequences were finally submitted to GenBank.

Degrees of intra- and interspecific variation of DNA barcode fragments were calculated under the Kimura 2-parameter model of nucleotide substitution using analytical tools of BOLD systems v. 4.0. (<http://www.boldsystems.org>). Neighbor-joining trees of representing the p-distance of DNA barcode data were constructed using MEGA 6 (Tamura *et al.* 2013) under the Kimura 2-parameter model for nucleotide substitutions.

The present contribution is based on material deposited in the following collections:

HNHM—Hungarian Museum of Natural History, Budapest, Hungary

KZM—Kaunas Tadas Ivanauskas Zoological Museum, Kaunas, Lithuania

MZH—Finnish Museum of Natural History, Helsinki, Finland

NKU—Insect Collection, College of Life Sciences, Nankai University, Tianjin, China

NMPC—National Museum Prague, Czech Republic

NUPP—Research collection of Kari & Timo Nupponen, Espoo, Finland

SMNK—Staatliches Museum für Naturkunde Karlsruhe, Germany

TLMF—Tiroler Landesmuseum Ferdinandeum, Hall in Tirol, Austria

ZIN—Zoological Institute Russian Academy of Sciences, Saint-Petersburg, Russia

ZMKU—Zoological Museum Kyiv Taras Shevchenko National University, Kyiv, Ukraine

Other abbreviations:

Gen. slide—genitalia slide; gen. prep.—genitalia preparation (in glycerol); JŠ—Jan Šumpich; HT—holotype; OB—Oleksiy Bidzilya; PH—Peter Huemer; PT—paratype.

Pinned specimens were photographed with an Olympus E-410 digital camera or Canon EOS 5DSR attached to an Olympus SZX12 microscope (OB), or with a Canon 750D with a Canon MP-E-65 mm lens (JŠ). Slide-mounted genitalia were photographed with a Canon EOS 600D digital camera mounted on an Olympus U-CTR30-2 trinocular head combined with a Carl Zeiss microscope body (OB) or with a Canon EOS 200D camera mounted on an Olympus CX31 stereomicroscope (JŠ). Sets of 10–60 images were taken for each photograph and assembled to deep-focused images using Helicon Focus 6 and edited in Adobe Photoshop CS5.

This present review covers the species distributed in Russia from the Altai Mountains in the West to Zabaikalskiy krai in the East. This area includes regions 22, 24–28 as accepted in the “Catalogue of Lepidoptera of Russia” (Ponomarenko 2019).

The species accounts are arranged based on the similarity of the male genitalia. Data from holotypes and names of the regions are cited exactly as on the labels of the specimens (transliterated in case of Cyrillic), whereas other material is organised in a standardised format rather than verbatim.

Results

Scrobipalpa acuminatella (Sircom, 1850)

Gelechia acuminatella Sircom 1850: lxxii.

Gelechia pulliginella Sircom, 1850: lxxii.

Gelechia cirsiella Stainton, 1851: 4.

Lita porcella Heinemann, 1870: 253.

Lita ingloriella Heinemann, 1870: 259.

Gelechia gracilella Stainton, 1871: 97.

Material examined. 1 ♂, **Russia**, Krasnojarskiy krai, 53°08'N 92°53'E, 375 m, Tanzybei forest station, Betula/Populus/meadow, 2.vi.1995 (Jalava & Kullberg) (gen. slide 329/16, OB) (MZH); 2 ♂, **Russia**, Altai Mts, 50°14'16"N 87°50'55"E, Kuraiskaja step, 1500–1700 m, 5.vii.2001 (Nupponen) (gen. slide 179/16, OB) (NUPP); 2 ♂, **Russia**, Altai Republic, Chagan-Uzun env., Krasnaya Gorka hill, 50°05'00"N, 88°25'15"E, rocky steppe, 1870 m, 1–3.vii.2019 (Šumpich) (Barcode NMPC-LEP-1102, NMPC-LEP-1068) (NMPC); 1 ♂, **USSR**, Irkutskaja obl., Sljudjanka 50 km E, river Hara-Murin, Betula bush ad. luc., 8–11.vii.1984 (Mikkola & Viitasaari) (gen. slide 245/16, OB) (MZH).

Molecular data. BIN: BOLD:AAC1644. The intraspecific average distance of the barcode region is 0.4% (n=154). The minimum distance to the nearest neighbour, an unidentified species of *Scrobipalpa* from Canada (BIN: BOLD:AAG9134), is 6.93 %.

Distribution. Europe; North Iran; Afghanistan; West Kazakhstan; **Russia**: European part, Novosibirsk region, Altai (new record), Kemerovo region, south of Krasnojarskiy krai (new record), Irkutsk region; eastern China (Bidzilya 2009: 5; Bidzilya & Li 2010: 2; Huemer & Karsholt 2010: 62).

Scrobipalpa notata (Povolný, 2001)

Euscrobipalpa notata Povolný 2001: 193.

Scrobipalpa notata (Povolný, 2001): Junnilainen *et al.* 2010: 49.

Type material examined. Holotype of *Euscrobipalpa notata*, ♂, **Ukraine**, Crimea, Karadagh, 23.vii.1990, Yu. Budashkin (gen. slide Bdz. 5, D. Povolný, remounted by PH, GU 03/1181) (ZMKU).

Material examined. 1 ♂, **Russia**, Altai Republic, Belyashi (Dzhazator) env. (25 km NW), confluence of Argut and Karagem rivers, 49°51'56"N, 87°10'22"E, rocky steppe, 1400 m, 27–28.vii.2017 (Šumpich) (gen. slide 185/21, OB) (Barcode NMPC-LEP-0369); 1 ♂, same data as for preceding (Barcode NMPC-LEP-0587) (all NMPC). 2 ♂, 1 ♀, **Armenia**, Chosrovo r-tas, 220, 1, 28.ix.1986 (Ivinskis) (gen. slides 78/22♂, 79/22♀, 88/22♂, OB) (KZM).

Molecular data. BIN: BOLD:ADR6354. The intraspecific average distance of the barcode region is 1.54% (n=3). The minimum distance to the nearest neighbour, *S. spumata* (Povolný, 2001) (BIN: BOLD:ACS9474), is 4.01%.

Distribution. **Ukraine** (Povolný 2001: 193); **Russia**: southern Ural (Junnilainen *et al.* 2010: 49), Altai (new record); **Armenia** (new record).

Scrobipalpa nupponeni sp. nov.

Figs 11–13, 71, 72

Type material. Holotype ♂, **Russia**, Altai Republic, 45 km N of Ulagan vill., Chulyshman valley, 51°01'56"N; 88°00'43"E, grassy steppe, rocks, 600 m, 4–5.vii.2019 (Šumpich) (NMPC). Paratypes: 4 ♂, same data as for holotype (gen. slide 282/20, OB) (Barcode NMPC-LEP-0621); 1 ♂, same locality but 27–28.vi.2015 (Šumpich) (gen. slide 258/20, OB) (Barcode NMPC-LEP-0605 [failed]) (all NMPC); 1 ♂, **Russia**, S-Buryatia, 50°58'59"N, 106°38'40"E, 550–600 m, Chikoy valley, Novoselenginsk vill. 10 km S, sand dunes/sandy steppe, 24.vi.2002 (Nupponen) (Barcode TLMF Lep 28344); 1 ♂, same data as for preceding (gen. slide 175/16, OB) (all NUPP).

Diagnosis. The new species is recognizable externally by its small size and the forewing rarely mixed with

yellow to light brown. The similar species *S. saxatilis* (Povolný, 1996) comb. nov. is larger (wingspan 13.0 mm), the light brown irroration is more distinct, the brown spot in the corner of the cell is absent. The broad sub-quadrate uncus, narrow sacculus and short vincular process are characteristic of the male genitalia. The close species *S. voltinella* (Chrétien, 1898) is somewhat similar in respect of the shape of uncus and tegumen, but other characters are quite different.

Description. Adult (Figs 11–13). Wingspan 8.0–9.0 mm. Head, thorax and tegula white with occasional yellow-tipped scales, frons white; labial palpus white with occasional brown-tipped scales on outer margin; scape of antenna white mixed with light brown, flagellomeres white ringed with brown. Forewing white mottled with light brown especially below costal margin and along termen; fold, termen and veins in distal half mixed with yellow; diffused yellow spot in middle of cell, light brown spot surrounded with yellow-tipped scales in cell corner; cilia grey, brown-tipped. Hindwing white, veins and margins light brown, cilia yellowish-brown.

Variation. Specimens from Altai are darker than those from Buryatia, with head, thorax and the ground colour of the forewing grey rather than white.

Male genitalia (Figs 71, 72). Uncus slightly longer than broad, weakly narrowed apically, posterior margin straight. Gnathos short, curved at about one-half; tegumen nearly as broad as long, with gradual transition to uncus, anteromedial emargination broadly rounded, extending to 1/3 length; cucullus gradually curved before middle, distinctly broadened at base and slightly broadened apically, extending to top of uncus; sacculus straight, 1.2 width of cucullus at base, about 1/5 length of cucullus, with short pointed tip; vinculum 2.5 times as broad as long, posteromedial emargination triangular at base and parallel-sided in distal portion, vincular process short, as broad as sacculus, apex rounded with pointed outwardly curved tips, with rather broad gap to sacculus; saccus parallel-sided to 3/4, then pointed, slightly extending beyond top of pedunculus; distal portion of phallus moderately broad, nearly parallel-sided, apex rounded, apical arm slender, at right angles to phallus; caecum rounded, moderately inflated, about 1/3 length of phallic tube.

Female. Unknown.

Biology. Adults were collected in late June—early July in various kinds of rocky steppes, sandy and dry mountain steppes at an elevation of 600 m.

Molecular data. BIN: BOLD: AEC7920. The intraspecific average distance of the barcode region is 2.05% (n=2). The minimum distance to the nearest neighbour, an unidentified species of *Scrobipalpa* from Canada (BIN: BOLD:AAG9134), is 8.1 % (p-dist) (Fig. 1).

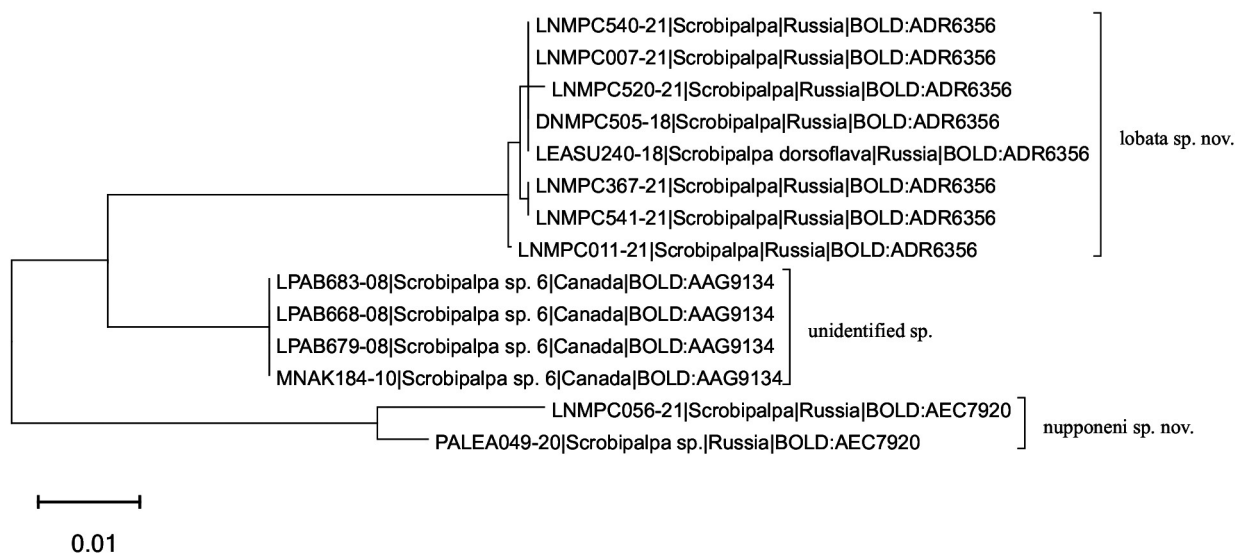


FIGURE 1. Neighbour-joining tree of *Scrobipalpa lobata* sp. nov. and *S. nupponeni* sp. nov. and their closest species, unidentified species from Canada, in BOLD.

Distribution. Russia: Altai, Buryatia.

Etymology. The new species is named in honour of the late Kari Nupponen, collector of part of the type series, in recognition of his outstanding contribution in exploring the Gelechiidae of Altai and Buryatia.

Remarks. Despite the above mentioned external variability, specimens from Altai and Buryatia have a similar wing pattern, agree completely in the male genitalia and have a 2.05% distance in the barcode region, justifying conspecificity.

Scrobipalpa rutjani sp. nov.

Figs 14, 15, 73, 74

Type material. Holotype ♂, **Kyrgyzstan**, Tian-Shan, Mts. Suusamy, fauc. cavi montis Ala-Bel', vall. Fluv. Tshytshkan, alt. 1600–1650 m, 10.v.2003, E. Rutjan (gen. slide 34/16, OB) (ZMKU). Paratypes: 1 ♂, same data as for holotype (gen. slide 50/16, OB) (Barcode TLMF Lep 28296); 1 ♂, same data as for holotype but 3.v.2003 (TLMF Lep 28297). 1 ♂, **Russia**, Tuva rep., 51°43'N 94°27'E, E. Tannu-Ola mts, 700 m, Kyzyl, Nanophyton-steppe, 5–6.vi.1995 (Jalava & Kullberg) (gen. slide 330/16, OB) (MZH); 1 ♂, Russia, Novosibirsk region, Ust'-Tarsk distr., Elanka vill., 12.vii.1996 (Ustjuzhanin) (gen. slide 186/08, OB) (ZMKU).

Diagnosis. Externally a rather characterless species with a uniformly blackish grey forewing and indistinct light brown irroration in fold and along the subcostal vein. *Scrobipalpa chrysanthemella* (Hoffmann, 1867) looks somewhat similar, but differs in the presence of black spots in fold and middle of cell. The male genitalia can be recognised by the broad sacculus, very short and narrow vincular process and very broad posteromedial emargination of the vinculum. Such combination of the male genitalia characters are characteristic of *S. acuminatella*, *S. hungariae* (Staudinger, 1871), *S. skulei* Huemer & Karsholt, 2010 and *S. notata*. Among these species, *S. rutjani* sp. nov. is most similar to *S. skulei*. However, the uncus is not constricted before the apex, the cucullus is longer (extending to the top of uncus), the sacculus is broader, the gap between the sacculus and vincular process is narrower and the saccus distinctly extends beyond the top of pedunculus (does not extend in *S. skulei*) (see Huemer & Karsholt 2010: 375, fig. 18 for comparison).

Description. Adult (Figs 14, 15). Wingspan 12.8–13.1 mm. Head and tegulae covered with black, grey-based and grey-tipped scales, frons slightly lighter, labial palpus upcurved, grey mixed with black, inner and upper surface of palpomere 2 white, scape black sparsely mixed with grey, flagellomeres black with narrow grey rings. Thorax greyish black. Forewing covered uniformly with black grey-tipped scales, subcostal vein and fold mottled with light brown; cilia grey, brown-tipped. Hindwing and cilia grey.

Male genitalia (Figs 73, 74). Uncus 1.5–2 times as long as broad at base, slightly narrowed apically with weak posteromedial emargination; gnathos short, slightly curved; tegumen moderately broad, with broadly rounded anteromedial emargination extending to 1/3 length, with gradual transition to uncus; cucullus weakly curved, of nearly even width, with rounded apex, extending to top of uncus; sacculus 1/4–1/3 length and twice as broad as cucullus, inner margin straight, outer margin broadly rounded in distal half, with inwardly curved short tip; vinculum twice as broad as long, with deep and broad triangular posteromedial emargination, vincular process very short and narrow, extending to tip of sacculus; saccus very narrow, far extending beyond top of pedunculus; distal portion of phallus straight, with pointed apex, apical arm narrow, weakly down-curved, caecum inflated, about 1/3 length of phallic tube.

Female. Unknown.

Biology. Adults have been collected from early May to mid June up to 1650 m elevation.

Molecular data. BIN: BOLD:AEC9411. The intraspecific average distance of the barcode region is 0% (n=2). The minimum distance to the nearest neighbour, *S. disjectella* (Staudinger, 1859) (BIN: BOLD:ADL6933), is 5.93% (p-dist) (Fig. 2).

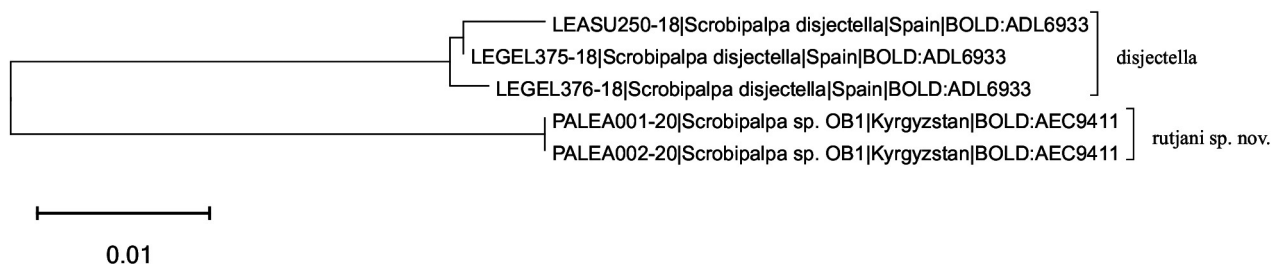


FIGURE 2. Neighbour-joining tree of *Scrobipalpa rutjani* sp. nov. and the closest species, *S. disjectella* (Staudinger, 1859) from Spain, in BOLD.

Distribution. Russia: Novosibirsk reg., Tuva; Kyrgyzstan.

Etymology. The new species is named in honour of Eugene Rutjan (Kyiv, Ukraine), the collector of the holotype of the new species.

Remarks. Specimens from Tuva and Novosibirsk region slightly differ in uncus which is more distinctly narrowed apically and has no emargination on its posterior margin. The conspecificity of material from Russia should be verified with genetic data in the future

Scrobipalpa superstes Povolný, 1977

Figs 16, 75

Scrobipalpa superstes Povolný 1977b: 189.

Material examined. 1 ♂, **Russia**, Altai Mts, 50°16-20'N 87°50-55'E, Kuraisky hrebet, 2400–2800 m, 7.vii.2001 (Nupponen) (gen. slide 259/16, OB) (Barcode TLMF Lep 28353 [failed]) (NUPP).

Molecular data. BIN: BOLD:ACY4407. The intraspecific average distance of the barcode region is 0.17% (n=10). The minimum distance to the nearest neighbour, *S. perfecta* (Povolný, 1996) (BIN: BOLD:AAW4627), is 4.65%.

Distribution. Portugal, Spain, France, Italy (Sardinia, Sicily) (Povolný 1977c: 189; Huemer & Karsholt 2010: 115), Greece, Israel (Bidzilya *et al.* 2019b: 50); Russia (new record): Altai.

Remarks. The male from Altai matches specimens from Europe both externally and in the genitalia except that the sacculus is distinctly narrowed apically (Fig. 75), and not parallel-sided as in specimens from Portugal (Huemer & Karsholt 2010: 390, fig. 61).

Scrobipalpa tannuoella sp. nov.

Figs 17, 76

Type material. Holotype ♂, **Russia**, Tuva rep., 50°45'N 94°29'E, E. Tannu-Ola mts, 5 km ENE, Khol-Oozha, steppe slopes, 1250 m, 16–19.vi.1995 (Jalava & Kullberg) (gen. slide 320/16, OB) (MZH).

Diagnosis. The new species is characterised externally by the uniformly greyish brown forewing with black mark in fold and a pair of black dots edged with brown in the cell corner. The similar species, *S. ochraeata* sp. nov. differs in the absence of black markings in the cell corner and in fold. *Scrobipalpa reiprichi* Povolný, 1984 is rather similar in the male genitalia, but differs externally in well developed black streaks on the costal margin. Long cucullus (far extending beyond top of uncus), short narrow vincular processes and elongate uncus are characteristic of the male genitalia. *Scrobipalpa reiprichi* differs in the shorter cucullus (not extending beyond the top of uncus), a narrower gap between cucullus and sacculus, more elongate vinculum and the saccus extending far beyond the top of the pedunculus (see for comparison Huemer & Karsholt 2010: 382, fig. 37). The new species differs from *S. intima* (Povolný, 2001) and *S. punctulata* Li & Bidzilya, 2019 in the longer cucullus, a distinct transition from tegumen to uncus, and the sacculus distinctly bent apically.

Description. Adult (Fig. 17). Wingspan 11.3 mm. Head, thorax and tegulae covered with grey, brown-tipped scales, frons grey, labial palpus upcurved, light grey mixed with brown, palpomere 2 white on inner and upper surface, scape brown, flagellomeres brown ringed with light grey. Forewing uniformly greyish brown, fold with black mark and mixed with light brown, pair of black spots edged with brown in cell corner, diffuse light grey subapical transverse fascia at 3/4, cilia grey, brown-tipped. Hindwing covered with grey, brown-tipped scales, cilia grey.

Male genitalia (Fig. 76). Uncus twice as long as broad, weakly narrowed apically, slightly constricted at 1/4, posterior margin with small medial emargination; gnathos short, narrow, pointed; tegumen elongate, with distinct transition to uncus, anteromedial emargination broad, extending to 1/3; cucullus narrow, of even width except slightly expanded in apical 1/4, extending distinctly beyond top of uncus; sacculus at base broader than cucullus, outer margin distinctly bent, 1/5 length of cucullus, with inwardly curved pointed tip, gap to cucullus broad and deep; vinculum twice as broad as long, posteromedial emargination broad, V-shaped, vincular processes short, narrow, with outwardly curved tip; saccus gradually narrowed towards pointed apex, extending beyond top of pedunculus; distal portion of phallus moderately broad, of equal width, apex rounded, apical arm narrow, caecum weakly inflated, 1/3 length of phallic tube.

Female. Unknown.

Biology. The holotype was collected in mid June in steppe slopes at an altitude of 1250 m.

Molecular data. No barcode available.

Distribution. Russia: Tuva.

Etymology. The species name reflects the distribution of the new species in the Tannu-Ola Mountain of Tuva Republic in Russia.

***Scrobipalpa intima* (Povolný, 2001)**

Figs 18, 19, 77, 78, 130

Euscrobipalpa intima Povolný 2001: 190.

Scrobipalpa intima (Povolný, 2001): Ponomarenko 2008: 4.

Type material examined. Holotype of *E. intima* ♀, [Russia] Zabaikalie, Chitinskaya obl., okr. s.[ela] Kyra, 900 m, light, 17.vii.1997, A. Bidzilya, I. Kostjuk, O. Kostjuk (gen. slide Bdz. 35, D. Povolný, remounted by OB) (ZMKU). Paratypes: 2 ♂, Zabaikalie, Nizhniy Tsasutchev env., sosnovyi bor, svet, 1.vii.1997 (Bidzilya, I. & O. Kostjuk) (gen. slide Bdz. 51, Bdz. 55, D. Povolný, remounted by OB); 1 ♂, Zabaikalie, Chitinskaya obl., okr. S. Kyra, 900 m, at light, 16.vii.1997 (A. Bidzilya, I. & O. Kostjuk) (gen. slide Bdz. 52, D. Povolný, remounted by OB); 1 ♂, Sokhondinskiy zapovednik, Agutsakan, 1200 m, at light, 1.vii.1997 (Bidzilya, I. & O. Kostjuk) (gen. slide Bdz. 49, D. Povolný, remounted by OB) (all ZMKU).

Material examined. 2 ♂, [Russia] Zabaikalie, Nizhniy Tsasutchev vicinity, sosnovyi bor, svet, 1.vii.1997 (A. Bidzilya, I. & O. Kostjuk) (gen. slide 222/19, OB) (ZMKU).

Diagnosis. *Scrobipalpa intima* is externally a uniformly greyish brown species with one small and two larger brown spots in the cell. It can hardly be distinguished externally from related species without studying the genitalia. *Scrobipalpa punctulata* is very similar but larger (13.5–16.0 mm) with more distinct brown spots. The elongate (length twice width) uncus emarginated apically in combination with the broad U-shaped posteromedial emargination of the vinculum, and nearly straight weakly curved and short cucullus are characteristic of the male genitalia. The similar species *S. punctulata* differs in the straight or rounded rather than apically emarginated uncus, sacculus as broad at base as cucullus (narrower than cucullus in *S. intima*), and deeper gap between the cucullus and sacculus. The female genitalia are recognised by the narrow, long lobes of the ventromedial depression entirely covered with foam sculpture with outwardly curved anterior tips. *Scrobipalpa zagulajevi* Lvovsky & Piskunov, 1989 is very similar but differs in the longer lobes of the ventromedial depression which extend distinctly beyond the anterior margin of sternum VIII.

Redescription. Adult (Figs 18, 19). Wingspan 9.8–13.0 mm. Head whitish grey, neck grey, brown-tipped; labial palpus greyish brown, palpomere 2 white on inner and upper surface; scape brown, flagelomeres brown, grey-ringed. Thorax and tegulae brown mixed with grey. Forewing grey uniformly mixed with brown, one small and two larger diffuse brown spots in cell, fold mottled with brown; cilia grey, brown-tipped. Hindwing and cilia grey.

Male genitalia (Figs 77, 78). Uncus twice as long as broad, weakly narrowed apically, posterior margin with short medial emargination; gnathos short, narrow, weakly curved; tegumen elongate, moderately narrow, anteromedial emargination extending to 1/3 length; cucullus of even width, weakly curved, extending to 1/2 length or to top of uncus; sacculus about as broad and 1/4–1/3 length of cucullus, outer margin with distinct medial emargination, tip inwardly curved, gap to cucullus broad and deep; vinculum twice as broad as long, anteromedial emargination broadly U-shaped, vincular process subtriangular, slightly broader at base than sacculus, tip pointed, curved outwardly, extending to tip of sacculus, gap to sacculus narrow; saccus distinctly or weakly pointed apically, extending beyond top of pedunculus; phallus weakly narrowed apically in distal portion, apex pointed, apical arm narrow, down-curved, caecum about 1/3 length of phallic tube.

Variation. Cucullus extends to 1/2 or to top of uncus; sacculus varies slightly in width from distinctly narrower at base than vincular process to subequal to latter in width; posteromedial emargination of vinculum varies from broad U-shaped to about V-shaped; saccus varies slightly in width and length being distinctly narrowed apically or about of even width, extending far or weakly beyond top of pedunculus.

Female genitalia (Fig. 130). Papillae anales subovate, sparsely covered with short setae; apophyses posteriores four times as long as apophyses anteriores; segment VIII twice as broad as long, weakly narrowed apically, posterior

margin of sternum VIII broadly emarginated, anterior margin straight, strongly edged; subgenital plates weakly broadened posteriorly, 1/3 length of sternum VIII, with patches of foamed sculpture in anterolateral 1/3, lobes of ventromedial depression narrow, extending posteriorly to 3/4 length of sternum VIII, entirely covered with foam sculpture, with outwardly curved anterolateral edge, not extending beyond anterior margin of sternum VIII, separated anteriorly by deep triangular incision; apophyses anteriores straight, as long as segment VIII; colliculum moderately broad, ring-shaped; ductus bursae weakly broadened towards corpus bursae, corpus bursae subovate, signum at right side near entrance of ductus bursae, basal plate of signum narrow with two small teeth, distal hook narrow, curved at about one-half.

Biology. Adults were observed in early July in steppe biotopes.

Molecular data. No barcode available.

Distribution. Russia: Zabaikalsiy krai (Povolny 2001: 190), China: Hebei (Bidzilya & Li 2010: 5; Li & Bidzilya 2019: 123).

***Scrobipalpa punctulata* Li & Bidzilya, 2019**

Figs 20, 21, 79, 131

Scrobipalpa punctulata Li & Bidzilya 2019: 105.

Type material examined. Holotype of *S. punctulata* ♂, [China] Mt. Luya, Ningwu County, Shanxi Province, 1450 m, 24.vii.2011, coll. Shulian and Jiayu Liu (gen. slide L13030) (NKU). Paratypes: 6 ♂, 1 ♀ (abdomen missing), same data as for holotype, 19, 20, 24.vii.2011 (gen. slide 71/14, O Bidzilya); 1 ♂, Baotainman, Neixiang County, Henan Province, 1200 m, 23.v.2006, coll. Xu Zhang and Jinmei Lv (gen. slide L06110) (all NKU).

Material examined. 1 ♂, Russia, SW-Buryatia, 51°47-48'N, 100°55-58'E, 700 m, E-Sayan Mts, 1450 m, Mondy vill., 2 km E, forest steppe, 13.vi.2002 (Nupponen) (TLMF Lep 28358); 1 ♂, same data as for preceding (gen. slide 299/16, OB) (TLMF Lep 28359); 1 ♂, same data as for preceding (gen. slide 263/16, OB) (Barcode TLMF Lep 28357); 1 ♂, same data as for preceding but 15.vi.2002 (gen. slide 223/19, OB) (Barcode TLMF Lep 28298); 1 ♀, same data as for preceding (gen. slide 404/16, OB) (all NUPP); 1 ♂, Chita region, Sokhondinskiy zapovednik, Agutsakan, 1200 m, at light, 7.vii.1997 (Bidzilya, I. Kostjuk & O. Kostjuk) (gen. slide 203/15, OB) (ZMKU).

Remark. *Scrobipalpa punctulata* was described from eight males and one female collected in Henan and Shanxi Provinces in China (Li & Bidzilya 2019). The abdomen of the single female from the type series has been lost, so that its genitalia have not been described. The male genitalia of specimens from Siberia (Fig. 79) match in all details the type specimens of *S. punctulata* from China. However, adults of the latter have darker, blackish grey rather than light grey hindwing (Figs 20, 21). The female genitalia are described here for the first time.

Female genitalia (Fig. 131). Papillae anales subtriangular, sparsely covered with short setae; apophyses posteriores four times as long as apophyses anteriores; segment VIII as broad as long; posterior margin of sternum VIII broadly emarginated, anterior margin straight, strongly edged; subgenital plates distinctly broadened posteriorly and almost connected at 3/4 length, smoothly sclerotised, with several transverse folds at base of apophyses anteriores; ventromedial depression smooth, medially merged, broadly rounded anteriorly, not extending beyond anterior margin of sternum VIII, separated anteriorly by short triangular incision; apophyses anteriores straight, as long as segment VIII; colliculum narrow, ring-shaped; ductus bursae gradually broadened, with indistinct transition to narrow, elongate corpus bursae, signum stout, distal hook broad at base, with short teeth in basal portion.

Molecular data. BIN: BOLD:AEC9426. The intraspecific average distance of the barcode region is 0% (n=3). The minimum distance to the nearest neighbour, *S. fontanensis* Varenne & Nel, 2017 (BIN: BOLD:ADJ0760), is 6.6%.

Distribution. Russia (new record): Buryatia, Zabaikalskiy krai; China: Henan, Shanxi (Li & Bidzilya 2019: 105).

***Scrobipalpa chitensis* (Povolný, 2001)**

Figs 22–24, 80, 81, 132, 133

Euscrobipalpa chitensis Povolný 2001: 188.

Scrobipalpa chitensis (Povolný): Ponomarenko 2008: 4.

Type material examined. Holotype of *E. chitensis* ♂, [Russia] Zabaikalie, Chita region, Kyra env., 4.vii.1997, on light, A. Bidzilya, I. Kostjuk, O. Kostjuk (gen. slide Bdz. 48, D. Povolný, remounted by OB) (ZMKU).

Material examined. 2 ♂, 2 ♀, Russia, S-Buryatia, 51°11–13'N, 106°10–12'E, 700 m, Hamar-Daban Mts, Murtoi river, Gusinoe Ozero vill. 6 km NW, forest steppe, 19.vi.2002 (Nupponen) (gen. slide 157/16♂, 173/21♀, OB); 1 ♂, same data as for preceding (gen. slide 155/16, OB) (Barcode TLMF Lep 28346); 1 ♂, same data as for preceding (gen. slide 213/19, OB) (Barcode TLMF Lep 28341); 1 ♀, same data as for preceding but 20.vi.2002 (gen. slide 140/21, OB) (Barcode TLMF Lep 28320); 1 ♀, same data as for preceding but 27.v.2006 (gen. slide 141/21, OB) (Barcode TLMF Lep 28321) (all NUPP); 1 ♂, [Russia] SE Transbaikalia, Borzya, 30.viii.1998 (Golovushkin) (gen. slide 282/08, OB) (ZMKU).

Remarks. *Euscrobipalpa chitensis* was described from a single male (Fig. 22) collected in the environs of Kyra village, Zabaikalskiy krai, Russia. The species is very similar to *S. bidzilyai* (for the differences see under that species). Here we describe the female genitalia of *S. chitensis* for the first time.

Female genitalia (Figs 132, 133). Papillae anales subovate, covered with long setae at base; apophyses posteriores 4 times as long as apophyses anteriores; segment VIII about as broad as long, sternum VIII densely covered with microspines, subgenital plates 1/3 width of sternum VIII, parallel-sided, lobes of ventromedial depression broad, rounded and separated by triangular incision anteromedially, not extending beyond anterior margin of sternum VIII; apophyses anteriores as long as segment VIII and 2–2.5 times length of ductus bursae; ductus bursae moderately broad, of even width except narrowed posterior portion; corpus bursae rounded, 1/3 length of ductus bursae; signum with large, subtriangular basal plate and straight or weakly curved acute process directed anteriorly.

Molecular data. BIN: BOLD:AEC6928. The intraspecific average distance of the barcode region is 0 % (n=4). The minimum distance to the nearest neighbour, *S. bidzilyai* (Povolný, 2001) (BIN: BOLD:AEC6545), is 3.04% (p-dist) (Fig. 3).

Distribution. Russia: Buryatia (new record), Zabaikalskiy krai (Povolný 2001: 188); China: Shaanxi, Ningxia (Li & Bidzilya 2019: 122).

***Scrobipalpa bidzilyai* (Povolný, 2001)**

Figs 25, 26, 82, 83, 134, 135

Euscrobipalpa bidzilyai Povolný 2001: 184.

Scrobipalpa bidzilyai (Povolný): Ponomarenko 2008: 4.

Type material examined. Holotype of *E. bidzilyai* ♂, Zabaikalie, Nizhniy Tsasutchey env., sosnovyi bor, 1.vii.1997, at light (O. Bidzilya, I. Kostjuk, O. Kostjuk) (gen. slide Bdz. 45, D. Povolný, remounted by OB) (ZMKU).

Material examined. 1 ♂, Russia, S-Buryatia, 51°11–13'N, 106°10–12'E, 700 m, Hamar-Daban Mts, Murtoi river, Gusinoe Ozero vill. 6 km NW, forest steppe, 22.vi.2002 (Nupponen) (gen. slide 196/19, OB) (Barcode TLMF Lep28319); 1 ♀, same data as for preceding (gen. slide 197/19, OB) (Barcode TLMF Lep28322); 1 ♀, Russia, S-Buryatia, 51°11–13'N, 106°10–12'E, 700 m, Hamar-Daban Mts, Murtoi river, Gusinoe Ozero vill. 6 km NW, forest steppe, 19.vi.2002 (Nupponen) (gen. slide 143/21, OB) (all NUPP); 2 ♂, Russia, Buryatia, Selenga distr., Taiozhnyi vill., 28.vii.1994, at light (Ustjuzhanin) (gen. slide 200/15, OB); 1 ♂, Zabaikalie, Chita region, Kyra env., 14,16,17.vii.1997, 900 m, at light (O. Bidzilya, I. Kostjuk, O. Kostjuk) (gen. slide Bdz. 7, D. Povolný, remounted by OB; 193/07, OB) (all ZNKU).

Diagnosis. *Scrobipalpa chitensis* (Figs 22–24) and *S. bidzilyai* (Figs 25, 26) are very similar to each other and cannot be separated unambiguously externally. However, *S. bidzilyai* is larger in wingspan (10.2–10.5 mm), whereas the wingspan of *S. chitensis* is 8.8–9.0 mm. The male genitalia are more diagnostic: in *S. chitensis* (Figs 80, 81) the uncus is shorter, subquadrate (subrectangular in *S. bidzilyai*); cucullus not reaching mid length of uncus (far extending beyond the top of the uncus in *S. bidzilyai*); the saccus is broader distally (distinctly acute in *S. bidzilyai*)

and the vincular process is shorter, broader and weaker, curved outwardly; posteromedial emargination of vinculum without inner hump (with distinct hump in *S. bidzilyai*). Additionally, the genitalia capsule of *S. bidzilyai* is larger (Figs 82, 83). The female genitalia of *S. bidzilyai* are nearly indistinguishable from those of *S. chitensis*. However, we found a small difference in the length of the ductus bursae that is 3–4 times the length of the apophyses anteriores in *S. bidzilyai* and 2–2.5 times in *S. chitensis*. Additionally, the ventromedial depression in *S. bidzilyai* is broader, and the subgenital plate bears a medial fold that is absent in *S. chitensis*. The total length of the female genitalia of *S. bidzilyai* is 1.5–2 times longer than that of the female genitalia of *S. chitensis*.

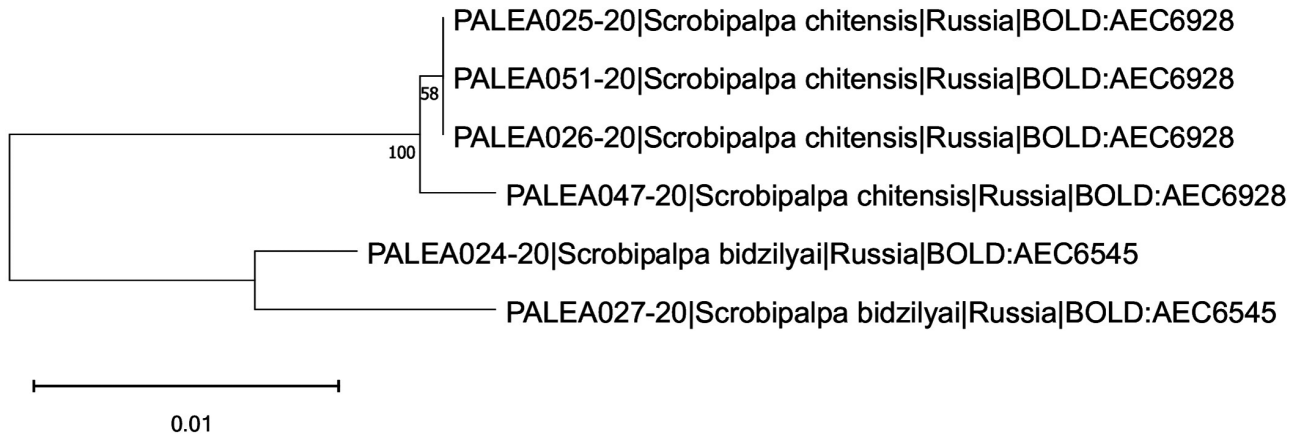


FIGURE 3. Neighbour-joining tree of *S. chitensis* (Povolný, 2001) and *S. bidzilyai* (Povolný, 2001) in BOLD.

Female genitalia (Figs 134, 135). Papillae anales subovate, covered with short setae; apophyses posteriores 4 times as long as apophyses anteriores; segment VIII about as broad as long, sternum VIII densely covered with microspines, subgenital plates 1/4 width of sternum VIII, parallel-sided, with medial folds, lobes of ventromedial depression broad, rounded, separated by triangular incision anteromedially, not extending beyond anterior margin of sternum VIII; apophyses anteriores as long as segment VIII and 3–4 times length of ductus bursae; ductus bursae moderately broad, of even width except narrowed posterior portion; corpus bursae rounded, 1/3 length of ductus bursae; signum with large, subtriangular basal plate and straight or weakly curved acute process directed anteriorly.

Molecular data. BIN: BOLD:AEC6545. The intraspecific average distance of the barcode region is 1.17 (n=2). The minimum distance to the nearest neighbour, *S. reiprichi* (BIN: BOLD:ACY6331), is 2.4 %.

Distribution. Russia: Buryatia, Zabaikalskiy krai (Povolný 2001: 184; Bidzilya 2009: 6); China: Hebei (Li & Bidzilya 2019: 128).

Remark 1. *Euscrobipalpa bidzilyai* was described from one male and one female collected in the vicinity of Nizhniy Tsasutchei (holotype) and Kyra (paratype) villages of Zabaikalskiy krai in Russia. The female genitalia of *S. bidzilya* illustrated by Povolný (2002: 72, fig. 727) are in fact those of *S. ferruginosa* (Povolný, 2001). For the details see below under the latter species. Here we describe the female genitalia of *S. bidzilyai* for the first time.

Remark 2. *Scrobipalpa caryocoloides* Povolný, 1977 was described from the holotype female collected in Japan (Hokkaido, Sapporo). The species looks indistinguishable superficially from *S. bidzilyai* and *S. chitensis*. The female genitalia of the holotype are very similar to those of *S. bidzilyai*. However, we prefer to treat *S. bidzilyai* and *S. caryocoloides* as separate species until more material from Japan including the unknown male becomes available.

Scrobipalpa peteri Bidzilya, 2009

Scrobipalpa peteri Bidzilya 2009: 7.

Material examined. 2 ♂, 1 ♀, **Russia**, Altai Republic, Aktash vill., 50°19'12"N, 87°36'00"E, 1400 m, grassy steppe, rocks, 21.vi.2015, 1400 m (Šumpich) (gen. slides 166/18♀; 170/18♂, OB); (NMPC-LEP-0928, NMPC-LEP-1021 [failed]) (NMPC); 1 ♂, 1 ♀, **Russia**, Altai Republic, 45 km N of Ulagan vill., Chulyshman valley, 51°01'56"N,

88°00'43"E, grassy steppe, rocks, 26–27.vi.2019, 600 m (Šumpich) (NMPC-LEP-1112) (NMPC); 1 ♂, Russia, Altai Republic, Chagan-Uzun env., Krasnaya Gorka hill, 50°05'00"N, 88°25'15"E, rocky steppe, 1870 m, 1–3.vii.2019 (Šumpich) (NMPC-Lep-1113) (NMPC); 1 ♂, Russia, Tuva rep., 50°16'N 94°54'E, 1250 m, ca 25 km W Erzin, steppe/stony slopes, 7–11.vi.1995 (Jalava & Kullberg) (gen. slide 315/16, OB) (MZH); 1 ♀, Russia, S-Buryatia, 50°58–59'N, 106°38–40'E, 550–600 m, Chikoy valley, Novoselenginsk vill. 10 km S, sand dunes/sandy steppe, 2.vi.2006 (Nupponen) (gen. slide 248/16, OB) (NUPP).

Molecular data. BIN: BOLD:AEO4689. The intraspecific average distance of the barcode region is 0% (n=3). The minimum distance to the nearest neighbour, *S. atriplicella* (Fischer von Röslerstamm, 1841) (BIN: BOLD:AAA9252), is 6.25%.

Distribution. Russia: Altai (new record), Tuva (Bidzilya 2009: 7), Buryatia (new record); China: Shanxi (Li & Bidzilya 2019: 124).

Scrobipalpa heretica Povolný, 1973

Scrobipalpa heretica Povolný 1973: 107.

Scrobipalpa submagnificella Povolný, 1977: 330.

Material examined. 3 ♂, Russia, Buryatia, 51°40'N 107°20'E, Barguzin valley, 35 km SW Ulan-Ude, Ivolginsk-Taphar, 700 m, steppe hill, 29.iv.1998 (Jalava & Kullberg) (gen. slide 189/16, 393/16; 168/21, OB); 3 ♂, 1 ♀, same data as for preceding but 7.v.1998 (gen. slide 257/16♂, 316/16♂, 321/16♂, OB) (all MZH); 1 ♂, Russia, Altai Republic, 45 km N of Ulagan vill., Chulyshman valley, 51°01'56"N; 88°00'43"E, grassy steppe, rocks, 600 m, 26–27.vi.2019 (Šumpich) (gen. slide 257/20, OB) (Barcode NMPC-LEP-0614); 2 ♂, Russia; Altai Republic, Kosh-Agach District, Kurai env. (6.5 km SW), 50°10'35"N, 87°53'55"E, grassy steppe, 1550 m, 30.vii.2017 (Šumpich) (Barcode NMPC-LEP-0332); 2 ♂, Russia, Altai Republic, Belyashi (Dzhazator) env. (25 km NW), confluence of Argut and Karagem rivers, 49°51'56"N, 87°10'22"E, rocky steppe, 1400 m, 27–28.vii.2017 (Šumpich) (Barcode NMPC-LEP-0356) (all NMPC).

Molecular data. BINS: BOLD:ACA7803 (Russia), BOLD:ADR4060 (Russia). The two BINs from Altai are nearest neighbours at a minimum distance of 2.88%. A genetically highly variable species which requires extensive re-assessment.

Distribution. Spain (Huemer & Karsholt 2010: 109), Russia: Volga region (Piskunov & Anikin 2001: 154), southern Ural (Junnilainen *et al.* 2010: 48), Altai (Ponomarenko 2019), Buryatia (new record); Turkey, Iran, Afghanistan, Kazakhstan, Kyrgyzstan (Povolný 2002).

Remarks. Specimens from Altai split into two genetic clusters. However, we did not find any reliable differences in the male genitalia between two compared specimens.

Scrobipalpa strictella Bidzilya & Li, 2010

Scrobipalpa strictella Bidzilya & Li 2010: 25.

Material examined. 1 ♂, Russia, Altai Republic, Kosh-Agach District, Kurai env. (15 km SW), Dzhangyskol lake (or Salagana lake), 50°10'49"N, 87°44'19"E, 1830 m, coniferous forest/steppe, 24–25.vi.2015 (Šumpich) (gen. slide 291/17, OB) (Barcode NMPC-LEP-0929 [failed]); 1 ♂, Russia, Altai Republic, Kosh-Agach Distr., Chagan-Uzun env., Krasnaya Gorka hill, 50°05'00"N; 88°25'15"E, rocky steppe, 1870 m, 29.vi.2015 (Šumpich) (gen. slide 252/20, OB) (Barcode NMPC-LEP-0600 [failed]); 1 ♂, Russia, Altai Republic, 45 km N of Ulagan vill., Chulyshman valley, 51°01'03"N; 88°00'39"E, grassy steppe, rocks, 600 m, 27–28.vi.2015 (Šumpich) (DNA Barcode NMPC-LEP-0591 [failed]) (all NMPC); 4 ♂, Russia, Tuva rep., 50°16'N 94°54'E, 1250 m, ca 25 km W Erzin, steppe/stony slopes, 7–11.vi.1995 (Jalava & Kullberg) (gen. slide 202/16, OB) (MZH); 1 ♂, Russia, S-Buryatia, 50°58–59'N, 106°38–40'E, 550–600 m, Chikoy valley, Novoselenginsk vill. 10 km S, sand dunes/sandy steppe, 3.vi.2006 (Nupponen) (gen. slide 337/16, OB) (NUPP).

Molecular data. No barcode available.

Distribution. Russia (new record): Altai, Tuva, southern Buryatia; China: Hebei (Bidzilya & Li 2010: 25).

Scrobipalpa tenebrata (Povolný, 2001)

Figs 27–29, 84–86, 136

Euscrobipalpa tenebrata Povolný, 2001: 197.

Scrobipalpa tenebrata (Povolný): Ponomarenko 2008: 4.

Type material examined. Holotype of *E. tenebrata* ♂, [Russia, Zabaikalskiy krai, 20 km N Chita] Chita, 28.vi.1993, I. Kostjuk (gen. slide Bdz. 11, D. Povolný, remounted by OB) (ZMKU).

Material examined. 1 ♂, [Russia, Zabaikalie], Jablonovo vill. near Chita, 17.vi.1991 (Kostjuk) (gen. slide 241/15, OB) (ZMKU); 1 ♂, Russia, SW-Buryatia, 51°47–48'N, 100°55–58'E, 700 m, E-Sayan Mts, 1450 m, Mondy vill. 2 km E, forest steppe, 15.vi.2002 (Nupponen) (gen. slide 355/16, OB) (Barcode TLMF Lep28347 [failed]); 1 ♂, Russia, SW-Buryatia, 51°47–48'N, 100°55–58'E, 700 m, E-Sayan Mts, 1450 m, Mondy vill. 2 km E, forest steppe, 13.vi.2002 (Nupponen) (gen. slide 297/16, OB) (Barcode TLMF Lep28348 [failed]); 1 ♂, Russia, SW-Buryatia, 51°47–48'N, 100°55–58'E, 700 m, E-Sayan Mts, 1450 m, Mondy vill. 2 km E, forest steppe, 13.vi.2002 (Nupponen) (gen. prep.) (Barcode TLMF Lep28307 [307 bp]); 1 ♂, Russia, S-Buryatia, 51°11–13'N, 106°10–12'E, 700 m, Hamar-Daban Mts, Murtoi river, Gusinoe Ozero vill. 6 km NW, forest steppe, 19.vi.2002 (Nupponen) (gen. slide 236/19, OB) (Barcode TLMF Lep28305) (all NUPP); 1 ♂, Russia, Buryatia rep., 54°35'N 110°48'E, Barguzin valley, Maisky vill., 500 m, sandy yard, 2–3.vii.1996 (Jalava & Kullberg) (gen. slide 335/16, OB). 1 ♂, NE China, Heilongjiang, distr., Fenglin Nature Reserve, 48°05'N, 129°85'E c 200–500 m, mixed Pinus/deciduous forest, 12–19.vi.2000 (Lkävalko) (Barcode TLMF Lep 28363 [282 bp]) (gen. slide 227/16, OB); 1 ♀, same data but 4–11.vi.2000 (gen. slide 226/16, OB) (all MZH).

Molecular data. BIN: BOLD:AEC7224. The intraspecific average distance of the barcode region is 0.16% (n=2). The minimum distance to the nearest neighbour, *S. obsoletella* (Fischer von Röslerstamm, 1841) (BIN: BOLD:AAF1200), is 5.45%.

Female genitalia (Fig. 136). Papillae anales subtriangular, densely covered with short setae; apophyses posteriores four times as long as apophyses anteriores; segment VIII about as broad as long, posterior margin of sternum VIII with broad triangular medial emargination extending anteriorly to about half length of segment VIII, subgenital plates subrectangular, weakly sclerotised along outer margins, with foam sculpture along inner margins from base of apophyses anteriores to mid-length posteriorly, lobes of ventromedial depression subovate with weakly pointed anteromedial corners, with deep triangular anteromedial emargination, densely covered with foam sculpture, not extending beyond posterior margin of sternum VIII; apophyses anteriores straight, as long as length of segment VIII; colliculum narrow, ductus bursae long and narrow, corpus bursae egg-shaped, signum stout, weakly curved, inner margin serrate to half.

Distribution. Russia: Buryatia (new record), Zabaikalskiy krai (Povolný 2001: 197); China (new record).

Remark 1. *Euscrobipalpa tenebrata* was described from a single male (Fig. 27) collected in the vicinity of Chita, Zabaikalskiy krai of Russia. The studied specimens from Buryatia and Zabaikalskiy krai match superficially and in the male genitalia the holotype of *S. tenebrata*. All examined specimens show variations in the length of the uncus and width of the saccus (Figs 84–86). However, DNA barcodes clearly justify them as one species with an interspecific variation of 0.16%.

Remark 2. *Scrobipalpa tenebrata* is probably conspecific with *S. felixi* Povolný, 1978. The latter was described from a single male from Mongolia. However, we hesitate to establish this synonymy until the holotype of *S. felixi* is examined. The female genitalia of *S. tenebrata* are characterised by the subgenital plate membranous along the outer margin in combination with foamy sculptured lobes of the ventromedial depression and stout signum. *Scrobipalpa zaitzevi* Piskunov, 1990 has a somewhat similar segment VIII with a partially membranous subgenital plate, but differs in the narrower and weaker covered with foam sculpture lobes of the ventromedial depression, longer apophyses anteriores that exceed the length of segment VIII (not exceeded in *S. tenebrata*), broader ductus bursae and smaller, rounded rather than egg-shaped corpus bursae as well as a shorter signum (Figs 137, 138).

Remark 3. Here we describe the female genitalia of *S. tenebrata* for the first time.

Scrobipalpa nitentella (Fuchs, 1902)

Lita nitentella Fuchs 1902: 324.

Phthorimaea seminella Pierce & Metcalfe, 1935: 97.

Material examined. 1 ♂, **Russia**, Buryatia, 51°40'N 107°20'E, Barguzin valley, 35 km SW Ulan-Ude, 700 m, steppe hill, 17.vii.1996 (Jalava & Kullberg) (gen. slide 318/16, OB) (MZH); 1 ♂, **Russia**, S-Buryatia, 51°28'N 106°33'E, 600 m, Gusinozersk vill., 5 km NNE lake Solyonoe, salt marsh/steppe, 26.vi.2002 (Nupponen) (gen. slide 343/16, OB) (NUPP).

Molecular data. BIN: BOLD:AAE9842. The intraspecific average distance of the barcode region is 0.42% (n=10). The minimum distance to the nearest neighbour, an unidentified species of *Scrobipalpa* from North America (BIN: BOLD:AAG9139), is 4.99%. No barcode available for specimens from Siberia.

Distribution. Europe, Tunisia, Turkey, Kazakhstan, **Russia**: south of European part, southern Ural, Buryatia (new record), Zabaikalskiy krai; **Afghanistan**, **Mongolia**, **China**: Qinghai, Xinjiang (Povolný 2001: 205; Ponomarenko 2008: 97; Bidzilya & Li 2010: 6; Huemer & Karsholt 2010: 156).

Scrobipalpa frugifera Povolný, 1969

Figs 30, 87, 140

Scrobipalpa frugifera Povolný 1969: 8.

Scrobipalpa hypothetica Povolný, 1973: 20.

Material examined. 1 ♂, **Russia**, Altai Republic, Kosh-Agach District, Kurai env. (6,5 km SW), 50°10'35"N, 87°53'55"E, grassy steppe, 1550 m, 9–10.vii.2014 (Šumpich) (Barcode NMPC-LEP-0570) (gen. slide 186/21, OB) (NMPC); 1 ♂, **Russia**, Altai Mts, 50°14-16'N 87°50-55'E, Kuraisky hrebet, 2300 m, 13.vii.2001 (Nupponen) (gen. slide 301/16, OB) (NUPP). 1 ♀, **SE Kazakhstan**, Uigur distr., Tchundzha vill. 15 km NW, Jasenevaya roshcha loc., 15.v.1991 (Ustjuzhanin) (gen. slide) (ZMKU). 1 ♀, **Mongolia**, Bulgan aimak, 11 km W von Somon, Bajannuur am See Bajannuur, 1000 m, Exp. Dr. Z. Kaszab, 1968 | Nr. 958, 14.vi–24.vii.1968 (gen. slide 287/19, OB) (HNHM).

Molecular data. BIN: BOLD:AEL6756. The intraspecific average distance of the barcode region is 1.5% (n=2). The minimum distance to the nearest neighbour, an unidentified species of *Scrobipalpa* from Canada (BIN: BOLD:AAG9134), is 2.25%.

Distribution. **Russia**: Kalmykia (Anikin & Piskunov 2003: 70), Altai, Tuva, South of Krasnoyarskiy krai, Buryatia, Zabaikalskiy krai, Khabarovskiy krai (Ponomarenko 2008: 96; Bidzilya 2009: 5); **Kazakhstan** (new record), **Kyrgyzstan** (Povolný 1996: 31), **Mongolia** (Povolný 1969: 8).

Remarks. An unidentified species of *Scrobipalpa* from Canada (BIN: BOLD: AAG9134) (Nazari & Landry 2012: 35, fig. 64) matches *S. frugifera* from Siberia in the male and female genitalia. However, a 2.25% (p-dist) from the male from Altai (BIN: BOLD:AEL6756) suggests further study to clarify if two species are involved.

Scrobipalpa zaitzevi Piskunov, 1990

Figs 31, 32, 88, 89, 137, 138

Scrobipalpa zaitzevi Piskunov 1990: 306.

Ilseopsis (Euscrobipalpa) punctata Povolný, 1996: 26. Syn. nov.

Type material examined. Holotype of *S. zaitzevi* ♂, **Mongolia**, G.[obi]-Alt.[aiskiy] Aim.[ak], 10 km SSE g.[ory] Ih-Obo-Ula, 3000 m, 18.vii.1970, Zaitzev | na svet | Mikr. Prep. № 15699, ♂, holotypus | Holotypus, *Scrobipalpa zaitzevi* Piskunov, sp. n. (gen. slide 176/08, OB) (ZIN).

Other material examined. 2 ♂, **Russia**, Altai Republic, Kosh-Agach distr., 10 km NE Kosh-Agach vill., Kurai Mts. Range, valley of Tabazhok river, 50°05'N 88°44'E, 2100 m, 2–4.viii.2016 (Huemer & Wiesmair) (gen. slides 427/16; 438/16, OB) (TLMF); 5 ♂, 9 ♀, Belyashi (Dzhazator) env. (25 km NW), confluence of Argut and Karagem rivers, 49°51'56"N, 87°10'22"E, rocky steppe, 1400 m, 27–28.vii.2017 (Šumpich) (gen. slides 247/20♂, 270/20♀,

OB) (Barcodes NMPC-LEP-0350, NMPC-LEP-0351, NMPC-LEP-0352) (NMPC); 2 ♂, Russia, Altai Republic, Chagan-Uzun env., Krasnaya Gorka hill, 50°05'00"N, 88°25'15"E, rocky steppe, 1870 m, 23.vii.2017 (Šumpich) (Barcode NMPC-LEP-0925) (NMPC); 4 ♂, the same data but 1–3.vii.2019 (Barcodes NMPC-LEP-1083, NMPC-LEP-1086) (NMPC). 3 ♂, 4 ♀, **Kyrgyzstan**, Tchichkan, 29.vii.2000, 1650 m (Rutjan) (gen. slides 170/08♀; 266/08♂; 104/13♀, 105/13♂, 64/16♀; 234/19♀, 235/19♂, OB) (ZMKU). 3 ♂, 1 ♀, **Tajikistan**, E-Pamir mts, 3950–4000 m, 38°06'40"N, 74°15'49"E, Mynkhadzhyr, 22.vii.2013 (Nupponen & Haverinen) (gen. slides 370/16♂, 371/16♀, OB) (Barcode TLMF Lep 28378; TLMF Lep 28379) (NUPP). 1 ♂, **Afghanistan**, Bamian Province, Bande-Amir, 2850 m, 20.vii.2013 (Pljushtch, Pak & Skrynik) (gen. prep.) (Barcode TLMF Lep 28310) (ZMKU).

Molecular data. BIN: BOLD:AAW4630. The intraspecific average distance of the barcode region is 0.36% (n=14). The minimum distance to the nearest neighbour, an unidentified species of *Scrobipalpa* from Iran (BIN: BOLD:ADF7691), is 5.13%.

Distribution. Russia: S Ural (Junnilainen *et al.* 2010: 50), Altai (new record); Kyrgyzstan (Povolný 1996: 26); Tajikistan (new record); Afghanistan (new record); Mongolia (Piskunov 1990: 306).

Remarks. *Scrobipalpa zaitzevi* was described from a single male collected in Gobi-Altai Aimak, southern Mongolia (Piskunov 1990: 306). *Scrobipalpa punctata* (Povolný, 1996) was described from a single female collected in the vicinity of Naryn, Kyrgyzstan (Povolný 1996: 26). We have been able to evaluate the DNA barcode of the holotype of *S. punctata* available on BOLD (Barcode MZH-LEP00000042) which fully corresponds to material identified as *S. zaitzevi*. We furthermore studied additional specimens of both sexes collected sympatrically in Kyrgyzstan. These specimens match externally and in the female genitalia the holotype of *S. punctata*. The male genitalia are conspecific with those of *S. zaitzevi* (Figs 88, 89). Despite the holotype of *S. zaitzevi* being in rather poor condition, its wing pattern resembles that of *S. punctata* from Kyrgyzstan and males from the Altai Mountains. Hence, the following synonymy is proposed: *Scrobipalpa punctata* (Povolný, 1996) syn. nov. of *Scrobipalpa zaitzevi* Piskunov, 1990.

The figure of the male genitalia of *S. punctata* from southern Ural mountains (Huemer & Karsholt 2010: 392, fig. 69) and adults of these species (Huemer & Karsholt 2010: 336, pl. 6, fig. 69 a,b) probably should be referred to *S. obsoletella*. However, the figure of the female genitalia (Huemer & Karsholt 2010: 480, fig. 69) is correct.

Scrobipalpa lobata sp. nov.

Figs 33, 90, 91, 139

Misidentification *dorsoflava* auct. (nec Povolný 1996).

Type material. Holotype ♂, **Russia**, Altai Republic, Chagan-Uzun env., Krasnaya Gorka hill, 50°05'00"N, 88°25'15"E, rocky steppe, 1870 m, 23.vii.2017 (Šumpich) (Barcode NMPC-LEP-1085) (NMPC); 9 ♂, Russia, Altai Republic, Aktash vill., 50°19'12"N, 87°36'00"E, 1400 m, grassy steppe, rocks, 21.vi. 2015 (Šumpich) (gen. slides 194/18, 182/21, OB) (Barcodes, NMPC-LEP-0334, NMPC-LEP-0576, NMPC-LEP-0930 [failed], NMPC-LEP-1093 [failed]); 1 ♂, Russia; Altai Republic, Kosh-Agach District, Kurai env. (15 km SW), Dzhangyskol lake (or Salagana lake), 50°10'49"N, 87°44'19"E, 1830 m, coniferous forest/steppe, 24, 25.vi. 2015 (Šumpich) (gen. slide 172/21, OB) (Barcode NMPC-LEP-0572); 5 ♂, Russia, Altai Republic, 45 km N of Ulagan vill., Chulyshman valley, 51°01'03"N; 88°00'39"E, grassy steppe, rocks, 600 m, 26, 27.vi.2019 (Šumpich) (DNA Barcodes NMPC-LEP-0932, NMPC-LEP-1105, NMPC-LEP-1106) (all NMPC); 1 ♂, Russia, Altai Mts, 50°14–16'N 87°50–55'E, Kuraiskaya steppe, 1500–1700 m, 5.vii.2001 (Nupponen) (gen. slide 300/16, OB); 2 ♂, 3 ♀, same data as for preceding but 26.vi.2002 (T. & K. Nupponen) (gen. slides 305/16♂, 306/16♀, OB) (all NUPP); 1 ♂, 1 ♀, Altai, Kosh-Agatch distr., Tyurgun' river near Tchuya tract, 1500 m, 7.vii.2001, at light (gen. slide 243/19♂, OB) (ZMKU); 1 ♂, 1 ♀, Russia, Tuva rep., 50°16'N 94°54'E, 1250 m, ca. 25 km W Erzin, steppe/stony slopes, 7–11.vi.1995 (Jalava & Kullberg) (gen. slides 323/16♀, 203/19♂, OB); 1 ♂, Buryatia, 51°40'N 107°20'E, Barguzin valley, 35 km SW Ulan-Ude, Ivolginsk-Taphar, 700 m, steppe hill, 29.iv.1998 (Jalava & Kullberg) (gen. slide 255/16, OB); 1 ♂ same data as for preceding but 7.v.1998 (gen. slide 317/16, OB) (all MZH).

Diagnosis. A rather variable species, but greyish black forewing with black spots in cell and fold, black subapical streak and light brown suffusion along veins, in fold and near dorsal margin are characteristic of most of the examined specimens. *Scrobipalpa dorsoflava* (Povolný, 1996) is very similar, but the black subapical streak is absent, and the dorsal margin is distinctly lighter in this species. The male genitalia are distinguished by the

sacculus being broadest in the middle with a distinctly bent dorsal margin in combination with a slender phallus with a strongly inflated caecum. *Scrobipalpa magnificella* Povolný, 1967 and *S. heretica* have a similar sacculus, but the vincular processes are shorter (not reaching top of sacculus), and the saccus is broader and shorter. The long lobes of the ventromedial depression that far extend beyond the anterior margin of sternite VIII and subgenital plates strongly sclerotised medially are characteristic of the female genitalia. *Scrobipalpa maniaca* Povolný, 1969 has similar long lobes of the ventromedial depression, but differs in the more uniformly sclerotised subgenital plate and very slender and long signum. *Scrobipalpa similis* Povolný, 1973 has shorter lobes of the ventromedial depression, more closely connected anteriorly, and a stronger curved signum. For the differences from other species see Huemer & Karsholt (2010: 111–112).

Description. Adult (Fig. 33). Wingspan 9.5–12.0 mm. Head covered with light grey scales tipped with brown, frons grey, palpomere 2 of labial palpus brown densely mixed with light grey, inner surface almost white, palpomere 3 greyish brown with narrow white medial ring and white apex, scape black, flagellum blackish brown with indistinct grey rings. Thorax and tegulae covered with brown, grey-tipped scales. Forewing greyish brown, two black spots in cell and in fold, black narrow apical streak from cell corner to apex, veins, especially subcostal, fold and dorsal margin with light brown suffusion, cilia grey, black-tipped. Hindwing and cilia grey.

Variation. Some specimens, especially worn ones, have a less distinct light-brown suffusion, others have veins mottled with light grey rather than light brown.

Male genitalia (Figs 90, 91). Uncus subrectangular, twice as long as broad, posteromedial corners rounded, posterior margin with short medial emargination; gnathos short, weakly curved; tegumen longer than broad, anteromedial emargination extends to 1/3 length of tegumen; cucullus slender, gradually curved, apex broadened and rounded, extending to or slightly exceeding top of uncus; sacculus broadest in middle, 1/4–1/3 length of cucullus, dorsal margin distinctly bent, ventral margin nearly straight, gap to cucullus narrow; vinculum broader than long, posterior margin with deep lyre-shaped medial emargination, vincular processes as broad as sacculus in middle, extending to top of sacculus, with outwardly curved pointed tips; saccus parallel-sided becoming evenly tapered towards apex; phallus moderately narrow, parallel-sided, with pointed apex, apical lobe slender, pointed, weakly down-curved, caecum distinctly inflated, 1/3 length of phallic tube.

Female genitalia (Fig. 139). Papillae anales subovate, densely covered with short setae, apophyses posteriores 3 times as long as apophyses anteriores; segment VIII slightly longer than broad, subrectangular, subgenital plate 1/3 width of sternum VIII, weakly sclerotised, unmodified in lateral half and strongly sclerotised, densely covered with microspines in medial half, patch of foam sculpture at base of apophyses anteriores, ventromedial depression largely covered with microspines, lobes far extend beyond anterior margin of sternum VIII, covered with foam sculpture anteriorly, separated with V-shaped emargination; apophyses anteriores as long as segment VIII; ductus bursae gradually broadened anteriorly, colliculum moderately broad; ductus bursae rounded to egg-shaped, signum with small basal plate, distal hook long, slender, weakly curved, with several teeth at base, placed at right side near entrance of ductus bursae.

Molecular data. BIN: BOLD:ADR6356. The intraspecific average distance of the barcode region is 0.15% (n=8). The minimum distance to the nearest neighbour, an unidentified species of *Scrobipalpa* from Canada (BIN: BOLD:AAG9134), is 5.81% (p-dist) (Fig. 1).

Distribution. Russia: southern Ural, Altai, Tuva, Buryatia.

Etymology. The specific name reflects the elongated lobes of the ventromedial depression that are characteristic of the new species.

Remarks. The species was erroneously identified as *S. dorsoflava* in a series of publications and introduced under this name in regional lists and catalogues (Huemer & Karsholt 2010: 12; Junnilainen *et al.* 2010: 47; Ponomarenko 2019: 101). In fact, *S. dorsoflava* is only known from the holotype from Kyrgyzstan.

***Scrobipalpa acuta* (Povolný, 2001)**

Eusrobipalpa acuta Povolný 2001: 182.

Scrobipalpa acuta (Povolný, 2001): Huemer & Karsholt 2010: 96.

Type material examined. Holotype of *E. acuta*, ♂, **Ukraine**, Kamennye Mohyly Nature Reserve, 24.viii.1995, na svete, A. Bidzilya (gen. slide Bdz. 12, D. Povolný, remounted by PH, GU 03/1175) (ZMKU).

Material examined. 1 ♂, **Russia**, Buryatia, 54°55'N, 111°14'E, Barguzin valley, 600 m, Djirga st., Betula/mead., 10.vii.1996 (Jalava & Kullberg) (gen. slide 267/16, OB) (MZH); 1 ♂, **Russia**, SW-Buryatia, 51°47-48'N, 100°55-58'E, 700 m, E-Sayan Mts, 1450 m, Mondy vill. 2 km E, forest steppe, 13.vi.2002 (Nupponen) (gen. slide 339/16, OB) (Barcode TLMF Lep 28350 [failed]) (NUPP). 1 ♂, **Mongolia**, Chentej aimak, sw. Somon Zenchermandal, u. Somon Žargaltschaan, 1400 m, Exp. Dr. Z. Kazsab, 1965, Nr. 313, 27.vii.1965 (gen. slide 289/19, OB) (HNHM).

Distribution. Ukraine (Povolný 2001: 182); **Russia**: South Ural (Huemer & Karsholt 2010: 97), Buryatia (new record); **Mongolia** (new record).

Molecular data. No barcode available.

Remarks. The specimens from Buryatia match externally *S. acuta* from Ukraine. The male genitalia slightly differ in having an apically broader uncus, longer vincular process and broader emargination of the posterior margin of the vinculum.

Scrobipalpa truncata (Povolný, 2002) comb. nov.

Figs 34, 92–94, 141

Euscrobipalpa truncata Povolný 2002: 74.

Scrobipalpa abstrusa Huemer & Karsholt, 2010: 113. Syn. nov.

Type material examined. Holotype of *E. truncata* ♂ (gen. slide Hk 5408, D. Povolný, remounted by OB) (MZH).

Material examined. 1 ♂, **Russia**, Altai, Ukok plateau, 2200 m, 18.vi.1995 (Bidzilya) (gen. slide 240/15, OB) (ZMKU); 1 ♀, **Russia**, Tuva, Kyzyl env., 7.vi.1999 (Lvovsky) (gen. slide 257/19, OB) (ZIN); 1 ♀, **Russia**, Tuva rep., 50°40'N 92°58'E, 750 m, L. Ubsa-Noor, shore mead./Nanophyton-steppe, 15.vi.1995 (Jalava & Kullberg) (gen. slide 312/16, OB) (MZH); 1 ♂, **Russia**, S-Buryatia, 51°11-13'N, 106°10-12'E, 700 m, Hamar-Daban Mts, Murtoi river, Gusinoe Ozero vill. 6 km NW, forest steppe, 27.v.2006 (Nupponen) (gen. slide 258/16, OB); 1 ♂, same data as for preceding (gen. slide 249/16, OB) (Barcode TLMF Lep 28360); 1 ♀, same data as for preceding (gen. slide 241/16, OB) (Barcode TLMF Lep 28314 [failed]); 1 ♂, same data as for preceding (gen. slide 348/16, OB); 1 ♀, same data as for preceding but 26.v.2006 (gen. slide 308/16, OB) (Barcode TLMF Lep 28313); 1 ♂, same data as for preceding (gen. slide 238/19♂, OB); 1 ♂, same data as for preceding but 4.vi.2006 (gen. slide 199/16, OB) (Barcode TLMF Lep 28312 [failed]); 1 ♂, **Russia**, S-Buryatia, 50°58-59'N, 106°38-40'E, 550-600 m, Chikoi valley, Novoselenginsk vill. 10 km S, sand dunes/sand steppe, 1.vi.2006 (gen. slide 250/16, OB); 1 ♂, ditto, but 2.vi.2006 (gen. slide 338/16, OB) (Barcode TLMF Lep 28364) (all NUPP); 1 ♂, **Russia**, Buryatia Rep., 54°35'N 110°48'E, Barguzin valley, Maisky vill., 500 m, sandy yard, 2–3.vii.1996 (Jalava & Kullberg) (gen. slide 334/16, OB) (MZH); 1 ♂ (paratype of *S. abstrusa*), Orenburg district, 8 km E Novoiletz, 9.vi.1998 (Nupponen) (gen. slide 3166, H. Hendriksen) (Barcode TLMF Lep 25594) (ZMUC). 1 ♂, **Mongolia**, Mongolskii Altai, 30 km S Biger, mountain steppe, 2600 m, 25.vi.1999 (Ustjuzhanin) (gen. slide 234/15, OB) (ZMKU). 1 ♂, **Kyrgyzstan**, Tian-Shan occ., Mts, Tshatkal, distr. Ala-Buka, prope Terek-daj, val. fluv. Kasan-Saj, alt. 2000 m, 24–26.v.2003, lum. (Rutjan) (gen. slide 242/19, OB) (ZMKU); 3 ♂, prov. Thschuy, distr. Jalyl, 42.2218°N, 73.6865°E, 2300 m, Suusamyр valley, Kischi-Korumdu, 2.vi.2010 (Pöll) (Barcodes TLMF Lep 21753, TLMF Lep 30541, TLMF Lep 30545) (TLMF).

Molecular data. BIN: BOLD:AAW5451. The intraspecific average distance of the barcode region is 0.78% (n=11). The minimum distance to the nearest neighbour, an unidentified species of *Scrobipalpa* from Canada (BIN: BOLD:AAG9134), is 5.81%.

Distribution. **Russia**: Cheliabinsk, Orenburg and Volgograd regions (Huemer & Karsholt 2010: 114), Altai (new record), Tuva, Buryatia (new record); **Kazakhstan** (Povolný 2002: 7); **Kyrgyzstan** (new record); **Mongolia** (new record).

Remarks. *Euscrobipalpa truncata* was described from a single male collected in the Alma-Ata Nature Reserve, SE Kazakhstan. *Scrobipalpa abstrusa* was described from a series of both sexes collected in the Amurskii village of the Cheliabinsk district, **Russia**. Our examination of the remounted “unrolled” slide of the male genitalia of the holotype of *S. truncata* (Figs 92–94) justifies its conspecificity with the holotype of *S. abstrusa* and other specimens from Siberia. Hence, the following synonymy is proposed: *Scrobipalpa abstrusa* Huemer & Karsholt, 2010 syn. nov. of *Scrobipalpa truncata* (Povolný, 2002).

Scrobipalpa marmorella Povolný, 1969

Figs 35, 95, 142

Scrobipalpa marmorella Povolný, 1969: 14.

Material examined. 5 ♂, 2 ♀, **Russia**, Altai Republic, Kosh-Agach Distr., Chagan-Uzun env., Krasnaya Gorka hill, 50°05'00"N; 88°25'15"E, rocky steppe, 1870 m, 29.vi.2015 (Šumpich) (gen. slides 229/20♂, 179/21♂, 180/21♀, 307/21♀, OB) (Barcodes NMPC-LEP-0582, NMPC-LEP-0613, NMPC-LEP-1087); 1 ♂, same data as for preceding but 23.vii.2017 (Barcode NMPC-LEP-0920); 9 ♂, same data as for preceding but 1–3.vii.2019 (Barcode NMPC-LEP-0612) (all NMPC); 2 ♂, 2 ♀, **Russia**, Altai, Kosh-Agatch 15 km S, Dzhalgyz-Tobe Mt., 1800 m, 8.viii.2000 (Bidzilya) (gen. slides 136/07♂, 138/07♂, 362/16♀, 241/19♀, OB) (ZMKU); 2 ♂, Tuva Republic, 50°40'N 92°58'E, 750 m, L. Ubsa-Noor, shore mead./Nanophyton steppe, 15.vi.1995 (Jalava & Kullberg) (gen. slide 322/16, OB) (all MZH). 1 ♂, **Tajikistan**, E Pamir Mts, 38°06'40"N 74°15'49"E, Mynkhadzhyr, 3950–4000 m, 22.vii.2013 (Nupponen & Heverinen) (gen. slide 385/16, OB) (NUPP).

Molecular data. BIN: BOLD:AEK6015. The intraspecific average distance of the barcode region is 0.0 % (n=11). The minimum distance to the nearest neighbour, an unidentified *Scrobipalpa* from Tajikistan (BIN: BOLD: AEC7919), is 3.04%.

Distribution. **Russia**: Altai, Tuva (Bidzilya *et al.* 2002; Bidzilya 2009); **Mongolia** (Povolný 1969), **Tajikistan** (new record).

Remarks. Although we have no new faunistic records of *S. marmorella*, we include the species in the list to illustrate the differences from the closely similar *S. truncata* and *S. inexplicitata* sp. nov.

Scrobipalpa kullbergi sp. nov.

Figs 36, 99

Type material. Holotype ♂, **Russia**, Tuva rep., 51°43'N 94°27'E, E. Tannu-Ola mts, 700 m, Kyzyl, Nanophyton-steppe, 5–6.vi.1995 (Jalava & Kullberg) (gen. slide 311/16, OB) (MZH).

Diagnosis. *Scrobipalpa kullbergi* sp. nov. is a small species with light grey forewing with diffuse brown oblique costal streak and black markings in the cell. The long parallel-sided sacculus and broad saccus are characteristic of the male genitalia. *Scrobipalpa pulchra* Povolný, 1967 has a somewhat similar long sacculus, but it is distinctly broadened apically rather than parallel-sided in the new species, the vincular processes in *S. pulchra* are very short and the saccus is much narrower.

Description. Adult (Fig. 36). Wingspan 12.1 mm. Head, thorax and tegulae covered with grey, brown-tipped scales, labial palpus upcurved, off-white, with broad brown basal and medial ring, inner and upper surface of palpomere 2 light greyish white, scape brown, flagellomeres brown ringed with grey. Forewing light grey mixed with blackish grey subcostally and in subapical 1/4, fold and subcostal vein mottled with light brown, diffuse light brown oblique streak from 1/4 of costa to mid-width, one small and two larger brown spots in cell, cilia grey, brown-tipped. Hindwing and cilia light grey.

Male genitalia (Fig. 99). Uncus twice as long as broad, weakly narrowed apically, posterior margin with short medial emargination; gnathos short, weakly curved; tegumen moderately narrow, elongate, anteromedial emargination extending to 1/3 length; cucullus slender, weakly curved, apex broadened, weakly pointed, extending to 2/3 length of uncus; sacculus twice as broad and about 3/5 length of cucullus, parallel-sided except for rounded apically outer margin, with pointed inwardly curved tip, gap to cucullus deep and slender; vinculum twice as broad as long, posterior margin with deep basally subovate emargination, vincular processes elongate, inner margin slightly curved inwardly, tip pointed, not extending to top of sacculus; saccus broad, truncate, far extending beyond top of pedunculus; distal portion of phallus weakly narrowed apically, apex rounded, apical arm moderately stout, at right angles to phallus; caecum strongly inflated, 1/2 length of phallic tube.

Female. Unknown.

Biology. The holotype was collected in early June in Nanophyton steppe biotope at an elevation of 700 m.

Molecular data. No barcode available.

Distribution. **Russia**: Tuva.

Etymology. The new species is named in honour of the Finnish Lepidopterologist Jaakko Kullberg, who collected the holotype of the new species.

***Scrobipalpa inexplicitata* sp. nov.**

Figs 37, 38, 96, 97, 143, 144

Type material examined. Holotype ♂, **Russia**, Altai Republic, Kosh-Agach distr., 10 km NE Kosh-Agach vill., Kurai Mts Range, valley of Tabazhok river, 50°05'N 88°44'E, 2100 m, 2–4.viii.2016 (Huemer & Wiesmair) (gen. slide 439/16, OB) (TLMF). Paratypes: 8 ♂, same data as for holotype (gen. slides 418/16, 422/16, 440/16, OB) (Barcodes TLMF Lep 20404, TLMF Lep 22274, TLMF Lep 22278, TLMF Lep 22281) (TLMF); 2 ♂, 1 ♀, **Russia**, Altai Republic, Belyashi (Dzhazator) env. (25 km NW), confluence of Argut and Karagem rivers, 49°51'56"N, 87°10'22"E, rocky steppe, 1400 m, 27–28.vii.2017 (Šumpich) (gen. slides 234/20♂, 299/21♀, OB) (Barcodes NMPC-LEP-0324, NMPC-LEP-0581) (NMPC); 1 ♀, **Russia**, Altai Republic, Chagan-Uzun env., Krasnaya Gorka hill, 50°05'00"N, 88°25'15"E, rocky steppe, 1870 m, 29.vi.2015 (Šumpich) (NMPC); 1 ♂, same data as for preceding but 23.vii.2017 (Barcode NMPC-LEP-0936); 3 ♂, same data as for preceding but 1–3.vii.2019 (Barcode NMPC-LEP-1094) (all NMPC); 1 ♂, 2 ♀, **Armenia**, Chosrovo r-tas, 21.ix.1986 (Ivinskis) (gen. slides 60/22♀, 67/22♂, 84/22♀, OB); 1 ♀, same data as for preceding but 22.ix.1986 (gen. slide 77/22, O OB); 1 ♂, 1 ♀, same data as for preceding but 20.ix.1986 (gen. slides 85/22♂, 88/22♀, OB); 1 ♀, same data as for preceding but 20.ix.1986 (KZM).

Diagnosis. *Scrobipalpa inexplicitata* sp. nov. is a medium-sized species with a predominantly grey forewing with a light brown suffusion and distinct black margings. The same forewing pattern is common in *Scrobipalpa* (e.g. *S. inferna* Povolný, 1973, *S. cryptica* Povolný, 1969, *S. bulganensis* Povolný, 1969), so that new species cannot be unambiguously recognised based on external characters alone. The male genitalia are characterised by the elongate uncus, narrow weakly curved inwards sacculus, long saccus and short hump on posterior margin of vinculum between the sacculus and vincular process. The presence of this hump separates the new species from *S. obsoletella*, *S. truncata* and *S. marmorella*. *Scrobipalpa cryptica* also has a short vincular hump, but the vincular process in the latter is broader than the sacculus (narrower in *S. inexplicitata* sp. nov.), and the posteromedial emargination of the vinculum is U-shaped in *S. cryptica* rather than V-shaped in the new species. Additionally, the new species can be separated from related species by the triangular rather than rounded at base incision of the posterior margin of vinculum. The female genitalia of *S. inexplicitata* sp. nov. are very similar to those of *S. ahasver* Povolný, 1969, but in the latter species the ventromedial depression is broader, its lobes are strongly sclerotised laterally and far extending anteriorly, and the colliculum is broader. *Scrobipalpa ahasver* clearly differs from *S. inexplicitata* sp. nov. superficially by the black forewing with a white angulated subapical fascia.

Description. Adult (Figs 37, 38). Wingspan 12.0–12.4 mm. Head, thorax and tegulae covered with light grey to pale brown-tipped scales, frons lighter, off-white, labial palpus upcurved, light grey densely mottled with brown, outer and upper surface of palpomere 2 white, scape brown, apex mixed distally with white, flagellomeres brown white-ringed. Ground colour of forewing light grey, costal margin mottled with black to 2/3, diffuse oblique black pattern from base and 1/4 of costal margin to half width, fold light brown with black spot, another black spot in middle of cell, pair of black spots in cell corner, diffuse dirty-white transverse fascia at 2/3, subapical area distinctly mottled with brown, cilia grey, brown-tipped. Hindwing and cilia grey, veins and margins greyish brown.

Variation. The forewings vary from predominantly grey with a light brown suffusion to predominantly light brown with a grey suffusion, greyish-white transverse fascia at 2/3 often indistinct or completely reduced.

Male genitalia (Figs 96, 97). Uncus twice as long as broad, rectangular or weakly narrowed apically; gnathos short, weakly curved; tegumen elongate with gradual transition to uncus, anteromedial emargination extending to 1/3 length; cucullus slender, extending to top of uncus, apex broadened; sacculus slightly broader and about 1/4 length of cucullus, weakly curved inwards, with short tip; vinculum twice as broad as long, posteromedial emargination broad, triangular at base and parallel-sided in distal half, vincular process subequal in width to sacculus, with distinct outwardly curved pointed top, short hump on posterior margin between sacculus and vincular process; saccus slender, gradually narrowed towards abruptly cut apex, far extending beyond top of pedunculus; distal portion of phallus straight, moderately broad, apex distinctly pointed, apical arm weakly down-curved, caecum about half length of phallic tube, weakly inflated.

Variation. One specimen has the sacculus distinctly broader than the cucullus, the saccus varies from truncate to pointed apically.

Female genitalia (Figs 143, 144). Papillae anales subovate, sparsely covered with short setae; apophyses posteriores about 3.5 times as long as apophyses anteriores; segment VIII as long as broad, sternum VIII with deep rounded posteromedial emargination, subgenital plates 1/4 width of segment VIII, smooth, with medial fold extending posteriorly to 1/2 length, with zone of short thorns at base of apophyses anteriores, ventromedial depression covered with fine microtrichia, lobes of ventromedial depression separated anteriorly with large, deep triangular incision with distinctly folded margins, not extending beyond anterior edge of sternum VIII; apophyses anteriores slightly longer than segment VIII, straight, moderately thick; colliculum narrow, ring-shaped; ductus bursae moderately broad, of even width, slightly narrowed before colliculum, with distinct transition to rounded corpus bursae, basal plate of signum with two teeth, distal hook slender to moderately broad, curved at obtuse angle in middle.

Biology. Adults have been collected in steppe habitats in late July—early August at altitudes up to 2100 m in the Altai Mountains, and in late September in Armenia.

Molecular data. BIN: BOLD:ADE0187. The intraspecific average distance of the barcode region is low with max. 0.16% (n=8). The minimum distance to the nearest neighbour, an unidentified species of *Scrobipalpa* from Kyrgyzstan (BIN: BOLD:AAW4628), is 3.04% (p-dist) (Fig. 4).

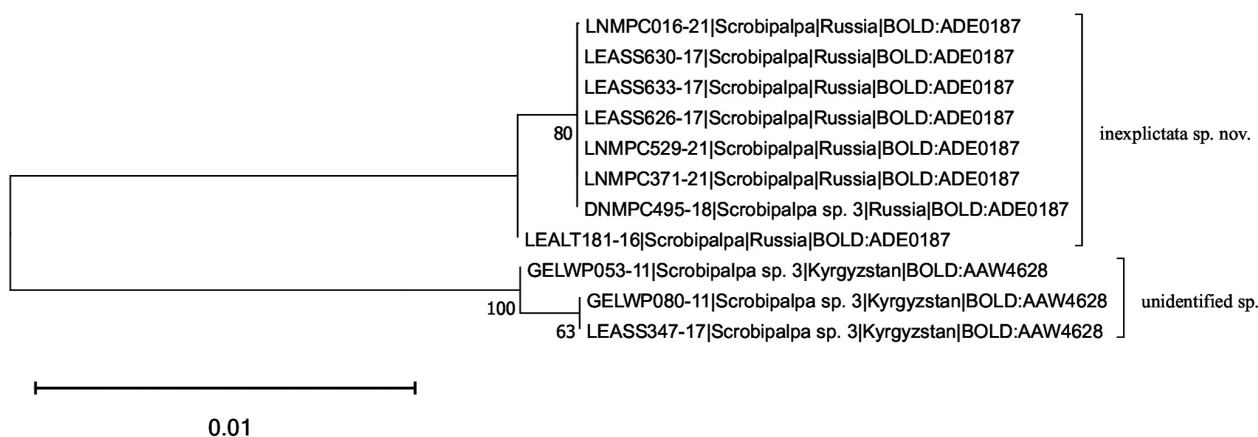


FIGURE 4. Neighbour-joining tree of *Scrobipalpa inexplictata* sp. nov. and the closest species, an unidentified species from Kyrgyzstan, in BOLD.

Distribution. Russia: Altai; Armenia.

Etymology. The specific name is derived from the Latin *inexplictus*, meaning obscure, inexplicable, referring to the ordinary appearance by which it is impossible to recognize new species among others with a similar forewing pattern.

Scrobipalpa sinica Bidzilya & Li, 2010

Scrobipalpa sinica Bidzilya & Li 2010: 24.

Material examined. 3 ♂, 2 ♀, **Russia**, Altai Republic, Kosh-Agach District, Tašanta env. (8 km N), bellow “11. station” ; 49°44'11"N, 89°20'02"E, 2280 m, rocky steppe, meadows, 1.vii.2015 (Šumpich) (gen. slides 175/18♂, 176/18♀, 177/18♀, OB) (Barcodes NMPC-LEP-0326, NMPC-LEP-1092); 1 ♀, Russia, Altai Republic, Kosh-Agach District, Kurai env. (15 km SW), Dzhangyskol lake (or Salagana lake), 50°10'49"N, 87°44'19"E, 1830 m, coniferous forest/steppe, 24–25.vi.2015 (Šumpich) (Barcode NMPC-LEP-0328); 4 ♂, 4 ♀, Russia, Altai Republic, Aktash vill., 50°19'12"N, 87°36'00"E, 1400 m, grassy steppe, rocks, 21.vi.2015, 1400 m (Šumpich) (Barcode NMPC-LEP-0327); 1 ♀, same data as for preceding but 11.vii.2014; 1 ♀, Russia, Altai Republic, Aktash env., road to “9. Station” (below Zavod), 50°19'14"N, 87°42'57"E, 2260 m, mountain meadows, 22–23.vi.2015 (Šumpich) (gen. slide 216/19, OB) (Barcode NMPC-LEP-0926 [failed]); 1 ♂, Russia, Altai Republic, Aktash env., road to “9. Station”—“ZAVOD”, 50°19'34"N, 87°43'54"E, 2400–2900 m, mountain meadows, 23.vi.2015 (Šumpich); 5 ♂, Russia, Altai Republic, Kosh-Agach Distr., Chagan-Uzun env., Krasnaya Gorka hill, 50°05'00"N; 88°25'15"E, rocky steppe, 1870 m, 1–

3.vii.2019 (Šumpich) (Barcodes NMPC-LEP-0611, NMPC-LEP-1090, NMPC-LEP-1101); 1 ♀, same data as for preceding but 29.vi.2015 (Barcode NMPC-LEP-0331); 1 ♂, Russia, Altai Republic, Kosh-Agach Distr., Beltir env. (16 km W), Chagan valley, 49°57'06"N; 87°53'39"E, coniferous forest/rocks, 2150 m, 2–3.vii.2014 (Šumpich); 4 ♂, 8 ♀, Russia, Altai Republic, 45 km N of Ulagan vill., Chulyshman valley, 51°01'03"N; 88°00'39"E, grassy steppe, rocks, 600 m, 27–28.vi.2015 (Šumpich) (gen. slide 223/20, OB) (Barcode NMPC-LEP-0929); 5 ♂, 2 ♀, same data as for preceding but 26–27.vi.2019 (Barcode NMPC-LEP-0924) (all NMPC); 1 ♂, Russia, Altai Mts, 50°16–20'N 87°50–55'E, Kuraisky hrebet, 2300 m, 8.vii.2001 (Nupponen) (gen. slide 372/16, OB) (NUPP); 3 ♂, Russia, Altai Republic, Kosh-Agach distr., 10 km NE Kosh-Agach vill., Kurai Mts. Range, valley of Tabozhok river, 50°05'N 88°44'E, 2100 m, 2–4.viii.2016 (Huemer & Wiesmair) (gen. slide 415/16, OB) (Barcodes TLMF 22273, TLMF 22279) (TLMF); 1 ♂, Russia, Tuva rep., 50°45'N 94°29'E, E. Tannu-Ola mts, 5 km ENE Khol-Oozha, steppe slopes, 1250 m, 16.vi.1995 (Jalava & Kullberg) (gen. slide 349/16, OB) (MZH); 1 ♂, Russia, S-Buryatia, 51°11–13'N, 106°10–12'E, 700 m, Hamar-Daban Mts, Murtoi river, Gusinoe Ozero vill. 6 km NW, forest steppe, 19.vi.2002 (Nupponen) (gen. slide 205/19, OB) (NUPP); 1 ♀, Russia, Buryatia rep., 54°35'N 110°48'E, Barguzin valley, Maisky vill., 500 m, sandy yard, 7.vii.1996 (Jalava & Kullberg) (gen. slide 295/16, OB) (MZH).

Molecular data. BIN: BOLD:ADG5210. The intraspecific average distance of the barcode region is 0.46% (n=13). The minimum distance to the nearest neighbour, an unidentified species of *Scrobipalpa* from Kyrgyzstan (BIN: BOLD:AAW4957), is 4.97%.

Distribution. Russia: Altai, Tuva (new record), Buryatia (new record); Kyrgyzstan; Mongolia; China: Inner Mongolia (Bidzilya & Li 2010: 24; Bidzilya & Nupponen 2018: 398).

Scrobipalpa cinerosella Bidzilya, 2009

Figs 39, 40, 98, 145

Scrobipalpa cinerosella Bidzilya 2009: 9.

Type material examined. Holotype of *S. cinerosella* ♂, **Russia**, Altai, Ongudai distr., Bolshoi Yaloman, 700 m, 2.viii.2001, svet, A. Bidzilya (gen. slide 194/08, OB) (ZMKU). Paratypes: 1 ♂, Altai, Ongudai distr., Tchuya river bank in 15 from Iodro vill., 6.viii.2000 (Bidzilya) (gen. prep.); 1 ♂, Altai, Kosh-Agatch distr., Dzhazator env., 1500 m, 28.vii.2001, at light (Bidzilya); 1 ♂, Tuva, 15 km S of Kyzyl, 14–15.vi.2001, 1000 m, steppe (Ustjuzhanin) (gen. slide 195/08, OB) (all ZMKU).

Other material examined. 2 ♂, 1 ♀, **Russia**, Altai Republic, Belyashi (Dzhazator) env. (25 km NW), confluence of Argut and Karagem rivers, 49°51'56"N, 87°10'22"E, rocky steppe, 1400 m, 27–28.vii.2017 (Šumpich) (gen. slides 240/20♀, 298/21♂, OB) (Barcode NMPC-LEP-0400) (NMPC).

Diagnosis. The species is characterised superficially by the forewing indistinctly divided into a grey costal part and light brown dorsal part. *Scrobipalpa inexplicitata* sp. nov. is similar, but the grey pattern is more distinct on the dorsal part. *Scrobipalpa perfecta* (Povolný, 1996) has a broader grey costal pattern that extends to the fold; *S. superba* (Povolný, 1996) comb. nov. has a narrower forewing. The male genitalia are distinguished by the elongate cucullus and tegumen, short sacculus and straight vincular process. *Scrobipalpa cinerea* (Povolný, 1996) comb. nov. is very similar but the sacculus is narrower than the adjacent portion of the cucullus (broader in *S. cinerosella*, Fig. 98), and the vincular process is broader in *S. cinerosella*. The smooth subgenital plate with a sclerotised pattern along the medial margins and the broad ductus bursae are characteristic of the female genitalia. *Scrobipalpa zaitzevi* is similar, but differs in the broader lobes of the ventromedial depression and sternum VIII with a weakly sclerotised anterior edge (strongly sclerotised in *S. cinerosella*).

Female genitalia (Fig. 145). Papillae anales subovate, sparsely covered with short setae; apophyses posteriores about 4 times as long as apophyses anteriores; segment VIII nearly as long as broad, sternum VIII with deep rounded posteromedial emargination, anterior margin distinctly sclerotised, subgenital plates 1/3 width of segment VIII, smooth, weakly sclerotised in lateral part and with distinct sclerotised pattern in medial part, anteromedially strongly edged, ventromedial depression covered with fine microtrichia in anterior part, lobes of ventromedial depression slender, separated anteriorly with large, deep triangular incision with distinctly edged margins, not extending beyond anterior margin of sternum VIII; apophyses anteriores distinctly longer than segment VIII, straight; colliculum narrow, ring-shaped; ductus bursae gradually broadened towards corpus bursae, corpus bursae small, rounded, signum at right side of ductus bursae before entrance to corpus bursae, basal plate of signum stout,

distal hook slender, short, with several basal teeth, gradually curved.

Biology. Adults have been collected in a rocky steppe biotope in late July at an altitude of 1400 m.

Molecular data. BIN: BOLD:ADR6357. Intraspecific DNA barcode variation unknown. The minimum distance to the nearest neighbour, *S. marmorella* (BIN: BOLD:AEK6015), is 3.86%.

Distribution. Russia: Altai, Tuva.

Remark 1. *Scrobipalpa cinerosella* is very similar externally and in the male genitalia to *S. cinerea* (see above under Diagnosis), but the females are quite different. We hesitate to synonymize these species until more extensive material of both species becomes available, and DNA study confirms the current association of the male sex to the corresponding female.

Remark 2. The female genitalia of *S. cinerosella* are described here for the first time.

Scrobipalpa inferna Povolný, 1973

Figs 41, 100

Scrobipalpa inferna Povolný 1973: 20.

Type material examined. Holotype of *S. inferna* ♂, **Mongolia**, Uvs aimak, Senke des Sees Ačit nuur, 26 km NO von Fluss Altan gadasin Chev gol, 33 km WSW von Pass Zenklegijn davaa, 2150, 4.vii.1968 | No. 1063, gen. slide no. Gz. 3933 [remounted by OB] (SMNK). The slide of female genitalia, same data as holotype, no. Gz. 4015 [the corresponding specimen has not been traced in SMNK].

Material examined. 1 ♂, **Russia**, Altai Mts, 50°14-16'N 87°50-55'E, Kuraiskaja step, 1500–1700 m, 13.vii.2001 (Nupponen) (gen. slide 253/16, OB) (Barcode TLMF Lep 28349) (NUPP); 1 ♂, Russia, Altai Republic, Kosh-Agach Distr., Chagan-Uzun env., Krasnaya Gorka hill, 50°05'00"N; 88°25'15"E, rocky steppe, 1870 m, 23.vi.2017 (Šumpich) (Barcode NMPC-Lep-0937); 1 ♂, same data as for preceding but 1–3.vii.2019 (Barcode NMPC-Lep-1109) (Šumpich) (all NMPC).

Molecular data. BIN: BOLD:AEC8323. The intraspecific average distance of the barcode region is 0% (n=3). The minimum distance to the nearest neighbour, *S. eremica* Povolný, 1967 (BIN: BOLD:ADF7437), is 3.83%.

Distribution. Mongolia (Povolný 1973: 20), Russia (new record): Altai.

Scrobipalpa altubura sp. nov.

Figs 42, 43, 101, 102, 146

Type material examined. Holotype ♂, **Russia**, Altai Republic, Kosh-Agach Distr., Chagan-Uzun env., Krasnaya Gorka hill, 50°05'00"N; 88°25'15"E, rocky steppe, 1870 m, 29.vi.2015 (Šumpich) (gen. slide 175/21, OB) (NMPC). Paratypes: 12 ♂, 19 ♀, same data as for holotype (gen. slides 176/21♀, 1/22♂, 2/22♀, OB; gen. slides 22061♂, 22063♂, 22064♀, 22065♀, JŠ) (Barcode NMPC-LEP-0355); 1 ♀, same data as for preceding but 23.vii.2017 (Šumpich); 18 ♂, 4 ♀, same data as for preceding but 1–3.vii.2019 (Šumpich) (Barcodes NMPC-LEP-0933, NMPC-LEP-0935, NMPC-LEP-1088, NMPC-LEP-1110); Russia, Altai Republic, Kosh-Agach Distr., Kurai env. (6.5 km SW), 50°10'35"N; 87°53'55"E, grassy steppe, 1550 m, 9–10.vii.2014 (Šumpich) (gen. slide 193/18, OB) (Barcode NMPC-LEP-0927); 3 ♀, Russia, Altai Republic, 45 km N of Ulagan vill., Chulyshman valley, 51°01'03"N; 88°00'39"E, grassy steppe, rocks, 600 m, 27–28.vi.2015 (Šumpich) (all NMPC except 2 spec. ZMKU); 1 ♂, Russia, Tuva rep., 50°16'N 94°54'E, 1250 m, ca 25 km W Erzin, steppe/stony slopes, 7–11.vi.1995 (Jalava & Kullberg) (gen. slide 269/16, OB) (MZH); 1 ♂, Russia, Tuva, 20 km W Erzin lake, 27.v.1989 (Zinchenko) (gen. slide 201/15, OB) (ZMKU); 1 ♂, Russia, S-Buryatia, 51°11-13'N, 106°10-12'E, 700 m, Hamar-Daban Mts, Murtoi river, Gusinoe Ozero vill. 6 km NW, forest steppe, 4.vi.2002 (Nupponen) (gen. slide 247/16, OB) (Barcode TLMF Lep 28300) (NUPP).

Diagnosis. The species can be recognised externally by the greyish black forewing with a distinct light brown pattern along the veins and small black markings. *Scrobopapla inferna* is very similar, but has more distinct black markings; *S. mongolica* Povolný, 1969 differs in a less distinct light brown suffusion in the dorsal half of the forewing. An elongate apically rounded uncus in combination with a short broad sacculus with pointed and posteriorly directed tip, narrow vincular process and deep posteromedial emargination of the vinculum are characteristic of the

male genitalia. In *S. mongolica* the saccus is broader, and the sacculus is narrowed at the base and extends to 1/3 length of cucullus (not narrowed at base and extends to 1/5 length of cucullus in the new species). The female genitalia are characterised by the slender, deeply divided lobes of the ventromedial depression, subgenital plates distinctly covered with foamy sculpture, broad ductus bursae with indistinct transition to short corpus bursae and sigmoid signum with small basal plate. *Scrobipalpa grisea* Povolný, 1969, *S. frugifera* and some other species have a somewhat similar sternum VIII but the broad ductus bursae, small narrow corpus bursae and sigmoid signum are characteristic of *S. altubura* sp. nov.

Description. Adult (Figs 42, 43). Wingspan 14.0–14.7 mm. Head, thorax and tegulae covered with grey, brown-tipped scales, frons paler, light grey to off-white, labial palpus upcurved, palpomere 2 grey densely mottled with brown, inner and upper surface white, palpomere 3 white with broad brown basal and medial rings, scape brown mixed with pale especially distally, flagellomeres brown ringed with light grey. Forewing greyish brown, distinctly mottled with black along margins and in subapical 1/4, diffuse oblique black pattern at base and in medial 1/3 between subapical vein and fold, two black spots in fold, pair of black spots in middle and in cell corner, black longitudinal streak at 3/4 in middle of wing, subapical vein and fold light brown, brown pattern along dorsal margin, in distal portion of cell and along veins in subapical area, diffuse light grey transverse fascia at 3/4; cilia greyish brown, black tipped. Hindwing and cilia light grey.

Variation. The specimens look darker, greyish brown or paler, light brown depending on the extent of the brown or grey scales.

Male genitalia (Figs 101, 102). Uncus twice as long as broad, posterior margin rounded; gnathos hook very short, weakly curved, culcitula well developed; tegumen distinctly elongate, anteromedial emargination extending to 1/3 length; cucullus about of even width, weakly broadened at base and in apical portion, apex weakly pointed, slightly extending beyond top of uncus; sacculus as broad or slightly broader than cucullus at base, about 1/5 length of cucullus, parallel-sided to 2/3 length, then narrowed towards pointed and posteriorly directed tip; vinculum twice as broad as long, posteromedial emargination broad, in shape of lyre, vincular process narrow, slightly shorter than sacculus, with outwardly curved pointed tip; saccus gradually narrowed apically, extending beyond top of pedunculus; distal portion of phallus moderately broad, weakly narrowed towards rounded or pointed apex, apical arm narrow, down-curved, caecum 1/3–1/2 length of phallic tube, weakly inflated.

Female genitalia (Fig. 146). Papillae anales slender, elongate, sparsely covered with short setae; apophyses posteriores 5 times as long as apophyses anteriores; segment VIII as long as broad at base, gradually narrowed posteriorly, sternum VIII with triangular posteromedial emargination, subgenital plates subrectangular, about 1/3 width of sternum VIII, densely covered with fine microtrichia, with digitate subovate patch of foamy sculpture extending from base of apophyses anteriores to half length of sternum VIII along its anterior margin, lobes of ventromedial depression slender, digitate, weakly covered with foamy sculpture anteriorly, divided by deep triangular incision anteriorly, extending anteriorly to 3/4 length of sternum VIII; apophyses anteriores slightly shorter than segment VIII, straight; colliculum narrow, ring-shaped; ductus bursae gradually broadened to 1/3 length, then of equal width, with indistinct transition to corpus bursae, corpus bursae ovate, slightly broader than ductus bursae, basal plate of signum very small, distal hook sigmoid, narrowing distally, directed posteriorly, placed at right side near entrance of ductus bursae.

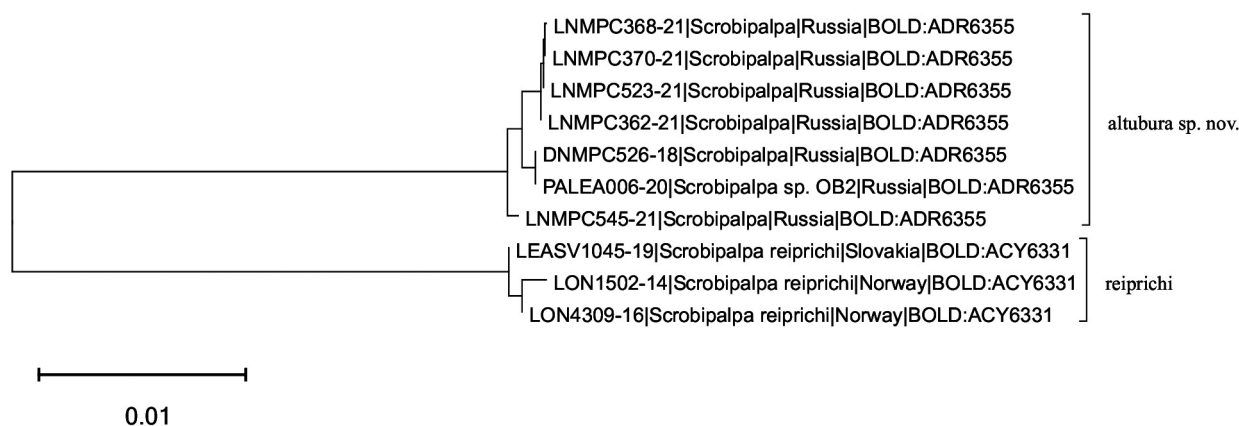


FIGURE 5. Neighbour-joining tree of *Scrobipalpa altubura* sp. nov. and the closest species, *S. reiprichi* Povolný, 1984 from Europe, in BOLD.

Biology. Adults have been collected in steppe biotopes from late May to late July up to 1250 m in mountains.

Molecular data. BIN: BOLD:ADR6355. The intraspecific average distance of the barcode region is 0.11 (n=8). The minimum distance to the nearest neighbour, *S. reiprichi* (BIN: BOLD:ACY6331), is 4.85 % (p-dist) (Fig. 5).

Distribution. Russia: Altai, Tuva, Buryatia.

Etymology. The specific name is combined from words “al” “tu” “bur”—the first words of the administrative regions (Altai, Tuva, Buryatia) where the new species occurs.

Scrobipalpa mongolica Povolný, 1969

Figs 44, 147

Scrobipalpa mongolica Povolný 1969: 14.

Euscrobipalpa mongolica (Povolný): Povolný, 2002: 56.

Material examined. 1 ♀, **Russia**, Altai Mts, Kosh-Agach Distr., Chagan-Uzun env., Krasnaya Gorka hill, 50°05'00"N; 88°25'15"E, rocky steppe, 1870 m, 29.vi.2015 (Šumpich) (gen. slide 170/21, OB) (Barcode NMPC-LEP-0354); same data as for preceding but 23.vii.2017 (NMPC-LEP-0938) (all NMPC). **Kyrgyzstan**, 1 ex., 40 km W Lake Issyk Kul, 13.viii.1990 (Kaila & Mikkola) (Barcode MZH-LEP00000054) (MZH).

Molecular data. BIN: BOLD:ACA7937. The intraspecific average distance of the barcode region is 1.43% (n=3). The minimum distance to the nearest neighbour, *S. ochraeata* sp. nov., is 5.72%.

Distribution. Russia: (new record) Altai; Kyrgyzstan (new record); Mongolia, China: Xinjiang, Qinghai, Inner Mongolia (Povolný 1969: 14, Bidzilya & Li 2010: 5).

Scrobipalpa ferruginosa (Povolný, 2001)

Figs 45, 46, 103, 148–150

Euscrobipalpa ferruginosa Povolný 2001: 187.

Scrobipalpa ferruginosa (Povolný): Ponomarenko 2008: 4.

Euscrobipalpa pinosa Povolný, 2001: 194. Syn. nov.

Type material examined. Holotype of *E. ferruginosa* ♀, [**Russia**] Zabaikalie, okr. s. Nizhniy Tsasutchei, Sosnovyi Bor, svet, 1.vii.1997 (A. Bidzilya, I. Kostjuk & O. Kostjuk) (gen. slide Bdz. 8, D. Povolný) (ZMKU); holotype of *E. pinosa* ♀, [**Russia**] Zabaikalie, okr. s. Nizhniy Tsasutchei, Sosnovyi Bor, svet, 1.vii.1997 (A. Bidzilya, I. Kostjuk & O. Kostjuk) (gen. slide Bdz. 50, Povolný) (ZMKU).

Material examined. 1 ♀, same data as for holotype of *E. ferruginosa* (gen. slide 163/08, OB); 1 ♂, [**Russia**] Zabaikalie, Chita, 26.vii.1997 (Bidzilya, I. Kostjuk & O. Kostjuk) (gen. slide 202/15, OB) (all ZMKU); 1 ♂, **Russia**, S-Buryatia, 51°11-13'N, 106°10-12'E, 700 m, Hamar-Daban Mts, Murtoi river, Gusinoe Ozero vill. 6 km NW, forest steppe, 19.vi.2002 (Nupponen) (gen. slide 290/16, OB) (Barcode TLMF Lep 28317 [failed]) (NUPP). 1 ♂, **Mongolia**, Gobi Altaj aimak, chasat chajrchan ul Gebirge cca 20 km S von Somon Zargalan, 2400 m, Exp. Dr. Z. Kazsab, 1966, 15.vii.1966 (gen. slide 293/19, OB) (HNHM).

Diagnosis. *Scrobipalpa ferruginosa* is defined externally by the light brown forewing with a dark costal margin and ochreous-brown head (Figs 45, 46). The male genitalia are characterised by the comparatively short and narrow weakly curved inwardly sacculus in combination with the nearly parallel-sided saccus, and cucullus distinctly broadened apically (Fig. 103). *Scrobipalpa alterna* Falkovitsh & Bidzilya, 2006 and *S. lutea* Povolný, 1977 are somewhat similar but the saccus is weakly curved inwardly, the vincular process is shorter and the cucullus is not broadened apically. The female genitalia of *S. ferruginosa* (Figs 148–150) are similar to those of *S. pseudolutea* Piskunov, 1990 and *S. pauperella* (Heinemann, 1870), but slightly differ in the shorter sternite VIII and shape of the signum.

Male genitalia (Fig. 103). Uncus slightly longer than broad, weakly narrowed apically, posterior margin rounded; gnathos short, slightly curved; tegumen elongate, with broadly rounded anteromedial emargination extending to 1/4 length, with gradual transition to uncus; cucullus narrow and straight, of nearly even width, except for broadened and weakly curved 1/4, with rounded apex, extending beyond the top of uncus; sacculus 1/5–1/4 length and nearly

as broad as cucullus, weakly narrowed posteriorly, with inwardly curved short tip; vinculum twice as broad as long, with V-shaped posteromedial emargination, vincular process subtriangular with outwardly curved tip, as broad at base as sacculus; saccus narrow, distal portion nearly parallel-sided, weakly extending beyond top of pedunculus; distal portion of phallus straight, with weakly pointed apex, apical arm narrow, weakly sinuate, caecum about as broad and half as long as phallic tube.

Molecular data. No barcode available.

Distribution. Russia: Buryatia (new record), Zabaikalskiy krai (Povolný 2001: 187); Mongolia (new record).

Remark 1. *Euscrobipalpa ferruginosa* was described from a single specimen (Fig. 45) collected in the vicinity of Nizhniy Tsasutchev village, Zabaikalskiy krai, Russia. The holotype proved to be female (frenulum consisting of three acanthae), its genitalia were erroneously placed under the male paratype of *S. bidzilyai*, whereas the male genitalia of the latter species were assigned to *S. ferruginosa* and figured in the original description (Povolný 2001: 186, fig. 7). The female genitalia of the holotype of *ferruginosa* which were treated as a female of *S. bidzilya* (Povolný 2001: 185, fig. 5), are conspecific with the holotype of *S. pinosa* (Fig. 149), which was described from a single female (Fig. 46) collected sympatrically with *S. ferruginosa*. The holotype of *S. pinosa* is also indistinguishable from the holotype of *S. ferruginosa* (Fig. 45). Both species were described in the same paper, on page 187 (*S. ferruginosa*) and on page 194 (*S. pinosa*). Hence we consider here *S. pinosa* (Povolný, 2001) a syn. nov. of *S. ferruginosa* (Povolný, 2001).

Remark 2. The male genitalia of *S. ferruginosa* are described here for the first time.

***Scrobipalpa krasnogorka* sp. nov.**

Figs 47, 48, 104, 105, 151

Type material examined. Holotype ♂, **Russia**, Altai Republic, Kosh-Agach Distr., Chagan-Uzun env., Krasnaya Gorka hill, 50°05'00"N; 88°25'15"E, rocky steppe, 1870 m, 1–3.vii.2019 (Barcode NMPC-LEP-1089) (NMPC). Paratypes: 10 ♂, 3 ♀, same data as for holotype but (gen. slides 22059♂, 22060♂, 22062♂, JŠ) (Barcodes NMPC-LEP-0934, NMPC-LEP-1077, NMPC-LEP-1097) (all NMPC, 2 spec. ZMKU); 10 ♂, 1 ♀, same data but 29.vi.2015 (gen. slides 248/20♂, 249/20♀, 171/21♂, 192/21♂, OB) (Barcodes NMPC-LEP-0330, NMPC-LEP-0583, NMPC-LEP-0584, NMPC-LEP-0585); 11 ♂, 3 ♀, same data but 1–3.vii.2019 (gen. slides 22059♂, 22060♂, 22062♂, JŠ) (Barcodes NMPC-LEP-0934, NMPC-LEP-1077, NMPC-LEP-1089, NMPC-LEP-1097) (all NMPC, 2 spec. ZMKU); 1 ♂, **Russia**, Altai Republic, Belyashi (Dzhazator) env. (25 km NW), confluence of Argut and Karagem rivers, 49°51'56"N, 87°10'22"E, rocky steppe, 1400 m, 27–28.vii.2017 (Šumpich) (gen. slide 169/21, OB) (Barcode NMPC-LEP-0588) (all NMPC).

Comparative material examined. *Scrobipalpa spumata* (Povolný, 2001). Holotype ♀, [**Russia**] Tuva, Tes-Khem, 29.vi.1969, Yu.A. Kostjuk (gen. slide Bdz. 33, D. Povolný) (ZMKU); 1 ♂, Tuva, 16 km S of Kyzyl, 14–15.vi.2001, 1000 m, steppe (Ustjuzhanin); 1 ♂, Tuva, 30 km NW Samagaltai, East Tannu-Ola foot, 1500 m, 24.vi.2001 (Ustjuzhanin) (gen. slide 141/07, OB) (all ZMKU); 1 ♂, Tuva Republic, 15°16'N 94°54'E, 1250 m, ca 25 km W Erzin, steppe/stony slopes, 7–11.vi.1995 (Jalava & Kullberg) (gen. slide 199/19, OB); 1 ♀, Tuva Republic, 50°40'N 92°58'E, 750 m, L. Ubsa-Noor, shore mead./Nanophyton steppe, 15.vi.1995 (Jalava & Kullberg) (gen. slide 373/16, OB) (all MZH). 1 ♂, **Kyrgyzstan**, Tian-Shan, vall. flus. Tschu, distr. Kotshkorka, vodochr. (=sea) Orto-Tokoj, alt. 1700 m, 8–9.vi.2003, lum. (Rutjan) (gen. slide 189/08, OB) (Barcode TLMF Lep 28335=Bidz. 00169) (ZMKU).

Diagnosis. The new species is characterised externally by the yellowish brown forewing with a distinct grey suffusion along the veins and costal margin, and diffuse pale angulate subapical fascia. The latter character separates *S. krasnogorka* sp. nov. from the externally similar *S. inferna*, *S. altubura* sp. nov. and *S. mongolica*. The slender elongate tegumen and uncus in combination with the long and broad vincular process, and short saccus are characteristic of the male genitalia. The female genitalia are distinguished by sternum VIII being entirely covered with foam sclerotisation, broad lobes of the ventromedial depression which far project anteriorly, the broad ductus bursae and slender signum. *Scrobipalpa spumata* has very similar male and female genitalia (Figs 106, 152), but differs in the broader, less narrowed apically vincular process in the male genitalia and less developed foam sclerotisation of sternum VIII in the female genitalia.

Description. Adult (Figs 47, 48). Wingspan 11.0–13.0 mm. Head, thorax and tegulae covered with light grey

scales tipped with dark grey or brown, frons paler, light grey to white, labial palpus upcurved, white densely mixed with greyish black, without distinct dark rings, palpomere 2 with inner surface lighter, off-white, upper side with brush of modified scales, palpomere 3 about 1/2 length and width of palpomere 2, acute, white apex, scape brown with a few white scales, flagellomeres brown ringed with white. Forewing ground colour yellow to light brown, veins and costal margin with distinct grey irroration. Hindwing and cilia grey.

Variation. Specimens look darker or lighter depending on the extent of grey irroration; diffuse ochreous-brown spots in the cell are present in the female paratypes.

Male genitalia (Figs 104, 105). Uncus subrectangular, twice as long as broad, posterior margin straight; gnathos slender, weakly curved; culcitula elongate, well developed; tegumen slender, elongate, with indistinct transition to uncus, anteromedial emargination broad, extending to 1/3 length of tegumen; cucullus slender, weakly curved, slightly expanded apically, extending to top of uncus; sacculus 1/4–1/3 length of cucullus, of even width, weakly constricted before middle, inner margin straight, outer margin bent inwards at 2/3, tip inwardly turned; vinculum twice as broad as long, posterior margin with broad V-shaped emargination, vincular process stout, twice as broad at base as sacculus, narrowed posteriorly, with distinct pointed outwardly curved tip, not extending to top of sacculus; saccus slender, gradually narrowed apically, extending to or slightly extending beyond top of pedunculus; distal portion of phallus straight, of about even width, as long as strongly inflated caecum, apical arm narrow, placed at right angles to phallus.

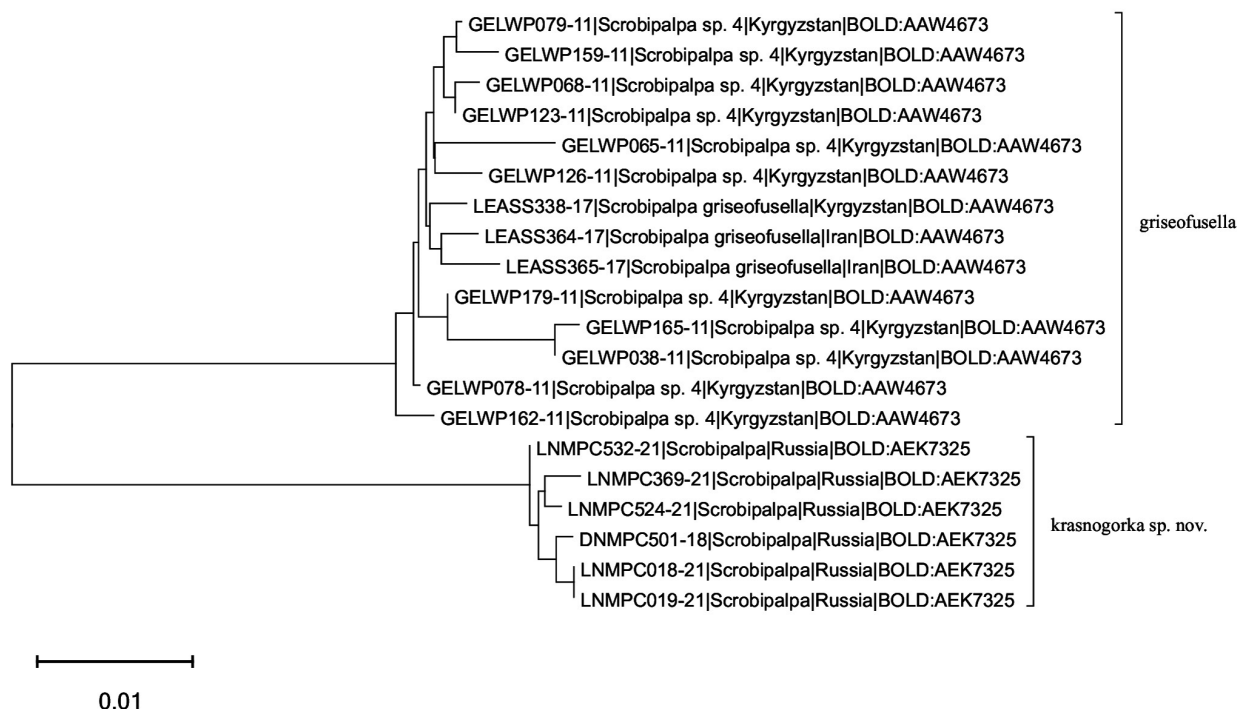


FIGURE 6. Neighbour-joining tree of *Scrobipalpa krasnogorka* sp. nov. and the closest species, *S. griseofusella* (Toll, 1947) from Asia, in BOLD.

Female genitalia (Fig. 151). Papillae anales subovate, covered with short setae; apophyses posteriores four times as long as apophyses anteriores; segment VIII slightly broader than long, posterior margin of sternum VIII as broad as long; subgenital plates parallel-sided, 1/3 width of sternum VIII, densely covered with foam sculpture from base of apophyses anteriores to 3/4 length; ventromedial depression covered with fine microtrichia, laterally broadly folded, lobes of ventromedial depression distinctly separated from subgenital plates, rounded and outwardly curved anteriorly, extending beyond anterior edge of sternum VIII, with triangular anteromedial gap, densely covered with foam sculpture; apophyses anteriores as long as segment VIII, straight; ductus bursae broad, of even width except for narrow posterior 1/6, colliculum short; corpus bursae clearly distinguished from ductus bursae, rounded, signum on right side near entrance of corpus bursae, basal plate of signum small, distal hook narrow, gradually curved, pointed, with three teeth at base.

Biology. Adults have been collected in late June in a rocky steppe biotope between 1400 to 1870 m elevation.

Molecular data. BIN: BOLD:AEK7325. The intraspecific average distance of the barcode region is 0.2%

(n=6). The minimum distance to the nearest neighbour, *S. griseofusella* (Toll, 1947) (BIN: BOLD:AAW4673), is 6.17% (p-dist) (Fig. 6).

Distribution. Russia: Altai.

Etymology. The specific name is derived from type locality—Krasnaya Gorka in Kosh-Agatch district in the Altai Mountains of Russia.

Scrobipalpa similis Povolný, 1973

Figs 49–52, 107–110, 154–157

Scrobipalpa similis Povolný 1973: 21.

Euscrobipalpa kyrana Povolný, 2001: 193. Syn. nov.

Type material examined. Holotype ♂, **Mongolia**, Südgobi aimak, 10 km NNO von der Stadt Dalanzadgad, 1450 m, Exp. Dr. Z. Kaszab | Nr. 898, 7.vii.1967 (gen. slide Gz. 4251, D. Povolný, remounted by OB) (SMNK). Holotype of *E. kyrana* ♀, [**Russia**] Zabaikalie, Chtia reg., Kyra vill. env., 17.vii.1997, at light (A. Bidzilya, I. Kostjuk & O. Kostjuk) (gen. slide Bdz. 54, D. Povolný) (ZMKU).

Material examined. 2 ♂, 5 ♀, [**Russia**] Zabaikalie, Chtia reg., Kyra vill. env., 14, 15, 17.vii.1997, at light (Bidzilya, I. Kostjuk & O. Kostjuk) (gen. slides 30/07♀; 31/07♂; 151/08♀; 216/15♀; 217/15♀; 124/16♀; 174/18♂, OB) (all ZMKU). 1 ♀, **Mongolia**, South Gobi aimak, Bain-Dag, 30 km NNE Bukgan, 26–28.vii.1967 (Emelyanov & Kerzhner) (gen. slide 245/15, OB) (ZIN). 6 ♂, 1 ♀, [**Kazakhstan**], 150 km NE Alma-Ata, Ili river right bank, Mynbulak, 2, 17–19.vii.1990, e. l. *Kalidium foliatum* (Pall.) Moq. (Falkovitsh) (gen. slides 27/07♂, 214/15♂, 215/15♀, OB) (all ZMKU).

Remarks. *Scrobipalpa similis* was described from the male holotype (Fig. 49) collected in south Mongolia. The specimen is in poor condition, the forewing pattern is indistinct with a brown spot in fold, diffuse brown costal spot at 3/4 and apex mottled with brown. The male genitalia are rather characteristic in the sacculus and vincular process being broad, of equal length and width, and the straight phallus with distinctly inflated caecum (Figs 107–110). Specimens whose males match the holotype of *S. similis* but females match the holotype *S. kyrana* have been found sympatrically in SE Kazakhstan and Zabaikalskiy krai of Russia. Moreover, in Kazakhstan these males and females have been bred from the same host plant, so that we have no doubt of their conspecificity to each other, and to *S. similis* and *S. kyrana* respectively. Hence, we establish the new following synonymy: *Scrobipalpa kyrana* (Povolný, 2001) syn. nov. of *Scrobipalpa similis* Povolný, 1973.

Biology. The larvae have been observed feeding in spun leaves of *Kalidium foliatum* in SE Kazakhstan, and hibernated in the final instar (Falkovitsh & Bidzilya 2006: 72).

Molecular data. No barcode available.

Distribution. SE Kazakhstan, Mongolia, Russia: Zabaikalskiy krai.

Scrobipalpa mixta Huemer & Karsholt, 2010

Figs 56, 111–114

Scrobipalpa mixta Huemer & Karsholt 2010: 148.

Material examined. 2 ♂, **Russia**, Tuva rep., 50°16'N 94°54'E, 1250 m, ca 25 km W Erzin, steppe/stony slopes, 7–11.vi.1995 (Jalava & Kullberg) (gen. slide 197/16, OB); 2 ♂, **Russia**, Tuva rep., 50°45'N 94°29'E, E. Tannu-Ola mts, 5 km ENE Khol-Oozha, steppe slopes, 1250 m, 16–19.vi.1995 (Jalava & Kullberg) (gen. slides 328/16, 332/16, OB); 1 ♂, **USSR**, SW-Altai, Katun valley, 10 km W Katanda, 1200 m, 28.vi–5.vii.1983 (Mikkola, Hippa & Jalava) (gen. slide 195/16, OB) (all MZH). 1 ♂, [**Kazakhstan**], Karagandinskaya obl., Kinelly Mt., 30 km W Zhana-Arka, 13, 14.v.1958 (Zagulajev) (gen. slide 81/16, OB) (ZIN). 1 ♂, **Ukraine**, Zaporizhzhya region, Yakymivka distr., Atmanai env., 17.iv.2016, at light (Zhakov) (gen. slide 206/16, OB); 3 ♂, same data as for preceding (Barcodes TLMF Lep 28323, TLMF Lep 28324, TLMF Lep 28325); 2 ♂, **Crimea**, Karadagh, 24.iv.1989 (Budashkin) (gen. slides 86/10, 217/16, OB); 1 ♂, same data as for preceding but 24.iii.1990; 1 ♂, same data as for preceding but 9.v.1985 (gen. slide 17/11, OB) (all ZMKU); 1 ♂, 1 ♀, [**North**] **Macedonia**, Ochrid, April, 1939 (Pinker) (gen. slides 277/20♂, 278/20♀, OB) (SMNK).

Molecular data. BIN: BOLD:AEC7813. The intraspecific average distance of the barcode region is 0% (n=3). The minimum distance to the nearest neighbour, *S. disjunctella* (BIN: BOLD:ADL6933), is 3.69%.

Distribution. Macedonia, Albania (record needs verification), Ukraine (Huemer & Karsholt 2010: 148), Russia (new record): Altai, Tuva; Kazakhstan (new record).

Remarks. The male genitalia of specimens from Tuva and Altai vary in the size of the gap between the vincular process and sacculus, the length of saccus (from 1/4 to about 1/2 length of cucullus), the width of the vincular process and the width of the saccus. However, they generally match *S. mixta* from Europe, which is also rather variable in respect of the male genitalia. We did not observe any external differences between specimens from Europe and Siberia.

Scrobipalpa buryatica sp. nov.

Figs 53, 54, 115, 116, 153

Type material. Holotype ♂, **Russia**, S-Buryatia, 51°11-13'N, 106°10-12'E, 700 m, Hamar-Daban Mts, Murtoi river, Gusinoe Ozero vill. 6 km NW, forest steppe, 19.vi.2002 (Nupponen) (gen. slide 378/16, OB) (Barcode TLMF Lep 28302) (NUPP). Paratypes: 1 ♀, same data as for holotype (gen. slide 379/16, OB) (Barcode TLMF Lep 28303); 1 ♂, same data but 4.vi.2006 (gen. slide 176/16, OB) (Barcode TLMF Lep28304) (all NUPP).

Diagnosis. A light, uniformly yellow to yellowish brown forewing with a darker costal margin is characteristic of the new species. *Scrobipalpa spumata* (Fig. 55) and uniformly coloured specimens of *S. krasnogorka* sp. nov. are nearly indistinguishable on the forewing pattern, but the head and labial palpus in *S. buryatica* sp. nov. are the palest among these three species, usually white with very indistinct dark markings. *Scrobipalpa lutea* has a similar wing pattern but differs in the presence of diffuse brown spots. The male genitalia of the new species can be recognised by the basally broad vincular process with a distinct, pointed, outwardly curved tip, and broad posteromedial emargination of the vinculum. *Scrobipalpa pauperella* (Heinemann, 1870), *S. arenbergeri* (Povolný, 1973) and *S. spumata* (Fig. 106) are similar in the shape of the sacculus and vincular process but differ in the narrower posteromedial emargination of the vinculum. *Scrobipalpa lutea* has a broader sacculus (twice as broad as the cucullus, only slightly broader in *S. buryatica* sp. nov.), and a longer uncus. The lobes of the ventromedial depression with pointed and anteriorly outwardly curved tips that project far beyond the anterior margin of sternum VIII in combination with the weakly modified subgenital plates are characteristic of the female genitalia. *Scrobipalpa spumata*, *S. krasnogorka* sp. nov. and *S. pauperella* differ in the narrower subgenital plates with a stronger developed foam sculpture and microtrichia, and the lobes of the anteromedial depression turned outwardly anteriorly (straight in *S. spumata* (Fig. 152), and *S. pauperella*). *Scrobipalpa lutea* has segment VIII distinctly longer than broad (slightly longer than broad in *S. buryatica* sp. nov.), and the subgenital plates are of equal width (broadened posteriorly in *S. buryatica* sp. nov.). For the differences in the genitalia of both sexes from *S. ferruginosa* see above under that species.

Description. Adult (Figs 53, 54). Wingspan 12.0–13.1 mm. Head white to yellowish white, slightly mixed with light brown on vertex, labial palpus upcurved, yellowish white, slightly mixed with light brown, inner surface white, scape light brown, flagellomeres yellow ringed with brown. Thorax and tegulae yellow to light brown. Forewing yellow mottled with light brown, costal margin and termen with distinct dark brown irroration, cilia yellow, brown-tipped. Hindwing grey with brown scales along veins and margins.

Variation. The female paratype has a darker forewing because of grey irroration along the veins.

Male genitalia (Figs 115, 116). Uncus 1.5 times as long as broad at base, gradually narrowed towards rounded posterior margin; gnathos short, weakly curved; tegumen broad, subtriangular, with broad anteromedial emargination; cucullus slender, weakly curved, slightly expanded apically, extending to top of uncus; inner margin of sacculus narrow, outer margin weakly curved, with small pointed tip, about 1/3 length of cucullus; vinculum twice as broad as long, posterior margin with broad emargination, vincular process at base 1.5 times as broad as sacculus, distinctly narrowed posteriorly, with distinct pointed outwardly curved tip, extending to 3/4 length of sacculus; saccus subtriangular, gradually narrowed apically, extending far or slightly beyond top of pedunculus; distal portion of phallus straight, of about even width, as long as strongly inflated caecum, apex pointed, apical arm narrow, placed at right angles to phallus.

Female genitalia (Fig. 153). Papillae anales subovate, covered with short setae; apophyses posteriores 4 times as long as apophyses anteriores; segment VIII slightly broader than long, posterior margin of sternum VIII with

broad triangular emargination, anterior margin strongly and broadly edged; subgenital plates gradually broadened posteriorly, from 1/4 (anteriorly) to 1/3 (posteriorly) width of sternum VIII, with patch of foam sculpture at base of apophyses anteriores; ventromedial depression narrow, covered with fine microtrichia, laterally broadly folded; lobes of anteromedial depression pointed and anteriorly outwardly curved, extending far beyond anterior edge of sternum VIII, with triangular anteromedial gap; apophyses anteriores slightly longer than segment VIII, straight; ductus bursae narrow posteriorly, then broad, colliculum short; corpus bursae weakly distinguished from ductus bursae, egg-shaped, signum on right side near entrance of corpus bursae, basal plate subrectangular with two teeth on inner margin, distal hook narrow, gradually curved, pointed.

Biology. Adults have been collected in June in forest-steppe habitats at an elevation of 700 m.

Molecular data. BIN: BOLD:AEC7223. The intraspecific average distance of the barcode region is 0% (n=3). The minimum distance to the nearest neighbour, *S. karadaghi* (Povolný, 2001) (BIN: BOLD:ADR5475), is 3.74% (p-dist) (Fig. 7).

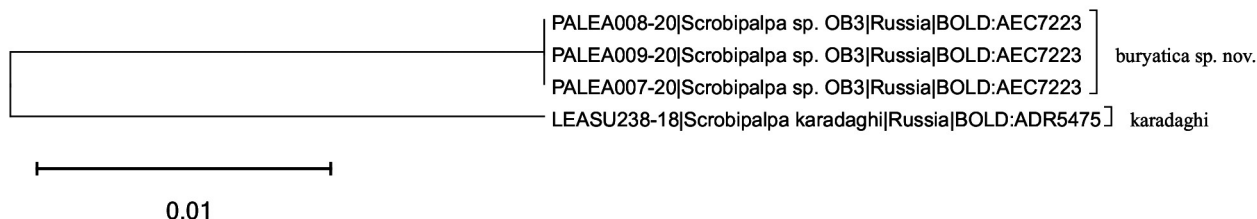


FIGURE 7. Neighbour-joining tree of *Scrobipalpa buryatica* sp. nov. and the closest species, *S. karadaghi* (Povolný, 2001) from southern Ural in Russia, in BOLD.

Distribution. Russia: Buryatia.

Etymology. The species name reflects the distribution of the new species in the Buryatia Republic of Russia.

Scrobipalpa pauperella (Heinemann, 1870)

Lita pauperella Heinemann 1870: 265.

Scrobipalpa (*Eusrobipalpa*) *klimeschi* Povolný, 1967: 220.

Materila examined. 1 ♂, **Russia**, SW-Buryatia, 51°47-48'N, 100°55-58'E, 700 m, E-Sayan Mts, 1450 m, Mondy vill. 2 km E, forest steppe, 13.vi.2002 (Nupponen) (gen. slide 142/21, OB) (TLMF 28306) (NUPP).

Molecular data. BIN: BOLD:AAF1201. The intraspecific average distance of the barcode region is 0.97% (n=43). The minimum distance to the nearest neighbour, an unpublished sequence in BOLD identified as *S. bryophiloides* Povolný, 1966 (BIN: BOLD:ADM1082), is 6.24%.

Distribution. Europe (Huemer & Karsholt 2010); Afghanistan; Russia: European part, Buryatia (new record), Zabaikalskiy krai; China: Ningxia, Gansu, Inner Mongolia (Povolný 2002; Bidzilya & Li 2010).

Scrobipalpa candicans (Povolný, 1996)

Ilseopsis (*Eusrobipalpa*) *candicans* Povolný 1996: 20.

Scrobipalpa candicans (Povolný): Bidzilya & Li 2010: 2.

Type material examined. Paratype of *I. candicans* ♀, USSR, **Kirgisia**, 41°25'N 76°20' E, 30 km E Naryn, 2500 m, agric. land/steppe, 29.vii.1990 ad luc. (Kaila & Mikkola) (gen. slide Hk. 5405, D. Povolný) (MZH).

Material examined. 2 ♀, **Russia**, Altai Republic, Kosh-Agach Distr., Chagan-Uzun env., Krasnaya Gorka hill, 50°05'00"N; 88°25'15"E, rocky steppe, 1870 m, 29.vi.2015 (Šumpich) (gen. slides 243/20, 262/20, OB) (Barcode NMPC-LEP-0353); 2 ♂, same data as for preceding but 1-3.vii.2019 (Barcodes NMPC-LEP-1099, NMPC-LEP-1100) (NMPC). 1 ♂, **Tajikistan**, W-Pamir mts, 2770 m, 38°18'34"N72°28'38"E, Murghab river valley by Barchadev village, 19.vii.2013 (Nupponen & Haverinen) (gen. slide 384/16, OB) (Barcode TLMF Lep 28376); 1 ♀, Tajikistan, W-Pamir mts, 2650 m, 38°18'34"N72°28'36"E, Murghab river valley by Barchadev village, 20.vii.2013

(Nupponen & Haverinen) (gen. slide 375/16, OB) (Barcode TLMF Lep 28377); 1 ♀, Tajikistan, W-Pamir mts, 2810 m, 37°00'55"N 72°34'32"E, Pianj/Pamir river by Zugvand village, 25.vii.2013 (Nupponen & Haverinen) (all NUPP).

Molecular data. BIN: BOLD:ADR4288. The intraspecific average distance of the barcode region is 0% (n=6). The minimum distance to the nearest neighbour, an unidentified species of *Scrobipalpa* from Kyrgyzstan (BIN: BOLD:AAW4629), is 2.39%.

Distribution. SE Kazakhstan, Kyrgyzstan, Tajikistan (new record), China (Xinjiang) (Povolný 1996: 20; Bidzilya & Li 2010: 2).

Scrobipalpa albiflava sp. nov.

Figs 57, 58, 117, 118

Type material. Holotype ♂, **Russia**, Tuva rep., 50°44'N 93°08'E, E. Tannu-Ola mts., Irbitel r.[iver], stony steppe slopes, 13–16.vi.1995 (Jalava & Kullberg) (gen. slide 203/16, OB) (MZH). Paratype: 1 ♂, Russia, Altai Republic, 45 km N of Ulagan vill., Chulyshman valley, 51°01'56"N; 88°00'43"E, grassy steppe, rocks, 600 m, 26–27.vi.2019 (Šumpich) (gen. slide 265/20, OB) (Barcode NMPC-LEP-0608) (NMPC).

Diagnosis. The species is characterised externally by the white head and yellowish brown forewing with a blackish brown pattern and black markings in the cell. Similar species *S. pulchra* is brighter, and the ochreous brown pattern is more distinct. The elongate uncus, long vincular processes (exceed length of sacculus), and phallus with a cluster of short spines are characteristic of the male genitalia. *Scrobipalpa maniaca* shares the two first characters, but the uncus is about 1/2 length of tegumen (1/3 in *S. albiflava* sp. nov.), the vincular process with tips more strongly curved outwardly, and the phallus with the caecum more strongly inflated and without the cluster of spines.

Description. Adult (Figs 57, 58). Wingspan 12.0–14.0 mm. Head white, labial palpus white with diffuse light brown basal and medial rings, inner surface of palpomere 2 white, scape white mixed with light brown, flegellomeres white ringed with brown. Thorax and tegulae white slightly shaded with light brown. Forewing yellowish white, mixed with brown along costal margin, in cell and in subapical 1/3, veins mottled with light brown, pair of black spots edged with light brown at 1/3 and 2/3 in middle of wing, diffuse black marks at base and in fold, indistinct white transverse fascia at 3/4; cilia white, brown-tipped. Hindwing light grey, cilia lighter, yellowish white.

Male genitalia (Figs 117, 118). Uncus twice as long as broad, nearly parallel-sided, weakly constricted in middle, posterior margin with shallow medial emargination; gnathos short, slender, weakly curved; tegumen gradually narrowed posteriorly, outer margins emarginated at 2/3 length, anteromedial emargination broadly rounded, extending to 1/3 length of tegumen; cucullus gradually curved, weakly narrowed before half, apex rounded, extending to posterior margin of uncus; sacculus about 1/4 length and as broad as cucullus at base, inner margin straight, outer margin weakly constricted in middle and rounded in distal half, with distinct pointed weakly inwardly curved tip; vincular process broader than sacculus at base, slightly narrowed and outwardly turned in distal portion, inner margin strongly edged, far extending beyond top of sacculus, vinculum slightly broader than long, posteromedial emargination deep, V-shaped; saccus slender, slightly narrowed towards rounded apex, slightly extending beyond top of pedunculus; phallus about of equal width, apex rounded with short thorn, apical lobe narrow, down-curved, cluster of spines on right side beyond half, caecum weakly swollen, 1/4–1/3 length of phallic tube.

Female genitalia. Unknown.

Biology. Adults have been collected from mid to late June in rocky steppe biotopes.

Molecular data. BIN: BOLD:AEK6016. The intraspecific average distance of the barcode region is unknown (n=1). The minimum distance to the nearest neighbour, an unidentified species of *Scrobipalpa* from Kazakhstan (BIN: BOLD:AEC9258), is 4%.

Distribution. Russia: Altai, Tuva.

Etymology. The specific name is derived from the Latin *album*, meaning white, and the Latin *flavum*, meaning yellow, referring to the forewing colouration characteristic of this species.

Scrobipalpa sibirica Bidzilya, 2009 sp. rev.

Figs 61, 62, 120, 121, 159

Scrobipalpa sibirica Bidzilya 2009: 9.

Type material examined. Holotype of *S. sibirica* ♂, **Russia**, Altai, Kosh-Agatchskiy r-n, 15 km vyshe s. Bel'tir po r.[eke] Tchagan, 2100 m, 30.vii.2000, svet, O. Bidzilya (gen. slide 8/16, OB) (ZMKU). Paratypes of *S. sibirica*: 1 ♀, Altai, Kosh-Agatchskiy r-n, s. Dzhazator, 1500 m, 28.vii.2001, svet (Bidzilya) (gen. slide 144/07, OB); 1 ♂, same data as for preceding but 22.viii.2000 (gen. slide GU 09/1316, PH); 6 ♂, **Russia**, Altai, 15 km S of Kosh-Agatch, Dzhalgыз-Tobe Mt., 1800 m, 8.viii.2000 (Bidzilya) (gen. slide 133/07, OB); 1 ♂, same data as for preceding (Barcode BIDZ-00172); 1 ♂, 2 ♀, **Russia**, Altai, Ongudaiskiy r-n, Bol'shoi Jaloman, 700 m, 2.viii.2001, svet (Bidzilya) (gen. slides 148/07♀, 93/16♂, 240/19♀, OB); 1 ♀, **Russia**, Altai, Ongudai distr., Tchuya river 15 km from Iodro village, 6.viii.2000 (Bidzilya) (gen. slide 92/16, OB) (all ZMKU).

Material examined. 3 ♂, 3 ♀, **Russia**, Altai Republic, Belyashi (Dzhazator) env. (25 km NW), confluence of Argut and Karagem rivers, 49°51'56"N, 87°10'22"E, rocky steppe, 1400 m, 27–28.vii.2017 (Šumpich) (gen. slides 232/20♀, 259/20♂, OB) (Barcode NMPC-LEP-0399); 1 ♀, **Russia**, Altai Republic, 45 km N of Ulagan vill., Chulyshman valley, 51°01'03"N; 88°00'39"E, grassy steppe, rocks, 600 m, 27–28.vi.2015, J. Šumpich leg. (all NMPC); 1 ♂, Tuva rep., 50°16'N 94°54'E, 1250 m, ca 25 km W Erzin, steppe/stony slopes, 7–11.vi.1995 (Jalava & Kullberg) (gen. slide 324/16, OB) (MZH); 1 ♂, **Russia**, Altai Republic, Kosh-Agach distr., 10 km NE Kosh-Agach vill., Kurai Mts. Range, valley of Tabazhok river, 50°05'N 88°44'E, 2100 m, 2–4.viii.2016 (Huemer & Wiesmair) (gen. prep.) (Barcode TLMF Lep 22282 (TLMF)). 1 ♂, **Kyrgyzstan**, prov. Batken, distr. Batken, 39.90331°N, 70.24049°E, 1730 m, Turkestan mts, 7 km ENE Rawal, 18.vi.2010 (Pöll) (Barcode TLMF Lep 21804) (TLMF).

Comparative material studied. Holotype of *Scrobipalpa occulta* (Povolný, 2002) (Fig. 160): ♀, Asia min., **Turcia**, 50 km östl. Istanbul, 16.ix.[19]67, 50 m.ü/M, leg. M.u.W. Glaser (gen. slide Gl. 4340, D. Povolný) (SMNK). 1 ♀, SE **Kazakhstan**, Tcharyn river valley, Tchundzha 15 km W, Yasenevaya roshcha, 24.vi.1990 (Pljushtch) (gen. slide 17/09, OB); 1 ♀, SE **Kazakhstan**, Uigur distr., Tchundzha vill. 15 km NW, Yasenevaya roshcha loc., 21–28.v.1991 (Ustjuzhanin) (gen. slide 85/16, OB); 1 ♀, N **Kazakhstan**, 20 km NE Atyrau (Guriev), Sagyz vill., 5.vi.2000 (Pak) (gen. slide 20/09, OB); 1 ♀, [SE **Kazakhstan**] 150 km NE Alma-Ata, right bank of Ili river, Mynbulak, 21.v.1990 (Falkovitsh) (gen. slide 06/09, OB); 1 ♀, [**Kazakhstan**, Akmolensk region], 12 km SE Derzhavinka, 31.vii.1958 (Falkovitsh) (gen. slide 21/09, OB) (all ZMKU).

Paratypes of *Scrobipalpa ochrogera* (Povolný, 1996) (Fig. 60): 2 ♂, USSR, 43 24N 75 2E, **Kazakhstan**, Dzhambul'skaya obl., 70 km NNE Frunze, 950 m, rocky slope, 15.viii.1990, ad luc. (Mikkola & Kaila) (gen. slide 169/16, OB) (MZH); 1 ♂, **Kyrgyzstan**, Issyk-Kul, pag. Barskoon, alt. 2300 m, 8.viii.2000 (Rutjan) (gen. slide 84/16, OB); 1 ♀, **Kyrgyzstan**, Issyk-Kul, prope Kadzhy-Saj, alt. 1650 m, 3–4.viii.2000 (Rutjan) (gen. slide 33/16, OB) (all ZMKU).

Molecular data of *S. sibirica*. BIN: BOLD:AAW5788. The intraspecific average distance of the barcode region is 0.72% (n=6). The minimum distance to the nearest neighbour, *S. ochrogera* (BIN: BOLD:ACA7833), is 2.72%.

Molecular data of *S. occulta*. BIN: BOLD:ADR5477. The intraspecific average distance of the barcode region is unknown (n=1). The minimum distance to the nearest neighbour, unidentified *Scrobipalpa* from Pakistan (BIN: BOLD:AEA2484), is 3.18% (p-dist).

Molecular data. The maximum distance within four available specimens of *S. sibirica* (NMPC-LEP-0399, TLMF Lep 22282, TLMF Lep 21804, BIDZ-00172) is 0.77 % (the mean distance 0.42 %). The mean distance between *S. sibirica* and *S. occulta* from S Ural (TLMF Lep 25657) is 3.74 % (p-dist) (Fig. 8).

Diagnosis. The species is characterized by the greyish black forewing with ochreous irroration in fold, under costal 1/2 and along veins in apical 1/3 in combination with pair of black spots edged with ochreous in the middle of the wing and in cell corner. *Scrobipalpa smithi* Povolný & Bradley, 1965 and *S. occulta* (Fig. 59) are very similar but usually paler with a more extensive ochreous pattern. The extremely broadened vincular process (twice as broad as sacculus) is the most characteristic diagnostic feature in the male genitalia. Similar species *S. occulta* has a narrower vincular process (1.5 times as broad as sacculus) (Fig. 160). The broad lobes of the ventromedial depression (broader than subgenital plates) are characteristic of the female genitalia of *S. sibirica*. *Scrobipalpa occulta* is similar, but has the lobes of the ventromedial depression as broad as the subgenital plates (Fig. 160). The vincular process of *S. ochrogera* (Fig. 119) is broader than in *S. occulta* but narrower than in *S. sibirica*.

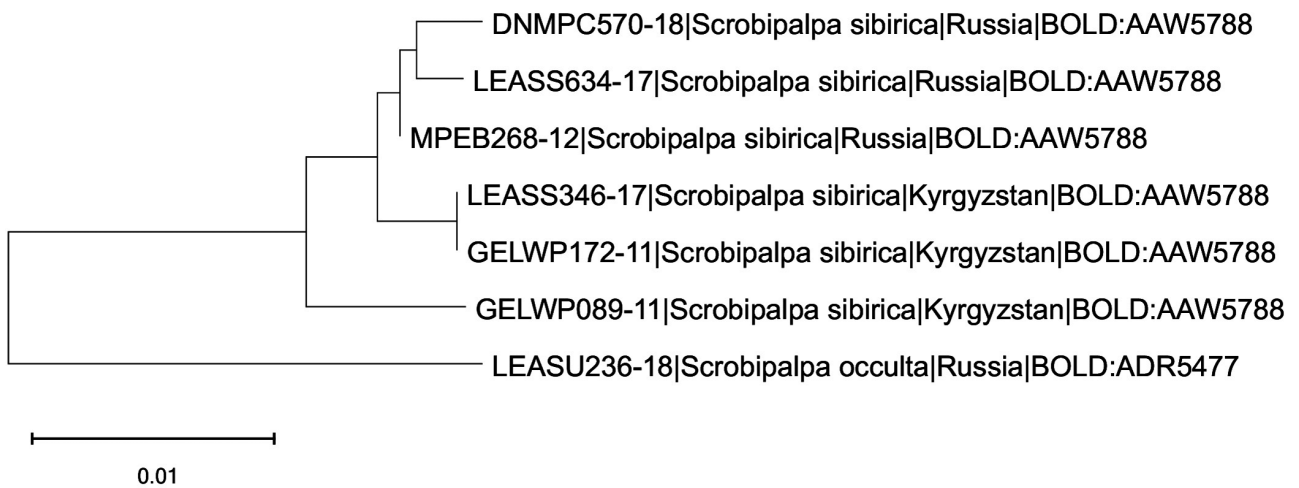


FIGURE 8. Neighbour-joining tree of *Scrobipalpa sibirica* Bidzilya, 2009 and *S. occulta* (Povolný, 2002) in BOLD.

Distribution. Russia: Altai, Tuva (new record), South of Krasnoyarskiy krai (Bidzilya 2009: 9); Kyrgyzstan (new record).

Remarks. *Scrobipalpa occulta* was described based on a single female (Fig. 59) collected near Istanbul, Turkey. Later, additional specimens including males were discovered in the southern Ural Mountains of Russia (Huemer & Karsholt 2010: 80–81). *Scrobipalpa sibirica* was described from a series of specimens collected in the vicinity of Beltir village, Altai Republic of Russia (holotype), other localities in the Kosh-Agatch district of Altai and one male from Krasnoyarskiy krai of Russia. All the studied females of *S. sibirica* differ both from the holotype of *S. occulta* and additional specimens of that species in the broader lobes of the ventromedial depression. We also found constant differences in the male genitalia (see above under Diagnosis) between *S. occulta* and *S. sibirica*. The morphological differences between these taxa are supported by molecular study: the mean distance between the *S. sibirica* and *S. occulta* from S Ural (Barcode TLMF Lep 25657) is 3.74 %. Hence, we reject the synonymy proposed by Huemer & Karsholt (2010: 80–81) and consider *S. sibirica* to be a separate species.

Scrobipalpa ochrogera was described based on five males collected in the Dzhabul region of Kazakhstan (Bishkek 70 km NNE) and one male collected 30 km E Naryn (Kyrgyzstan) (Fig. 60). The species is undoubtedly related to both *S. sibirica* and *S. occulta* but 3 % barcodes divergent justifies a separate species. We expect further taxonomic changes in this complex after variations in the female genitalia and males of *S. occulta* from the type locality have been studied. The molecular study seems very promising in this respect too.

Scrobipalpa proclivella (Fuchs, 1886)

Lita proclivella Fuchs 1886: 68.

Scrobipalpa proclivella Povolný 1967: 224.

Material examined. 1 ♂, Russia, Krasnoyarskiy krai, 53°08'N 92°53'E, 375 m, Tanzybei forest station, Betula/Populus/meadow, 2.vi.1995 (Jalava & Kullberg) (gen. slide 275/16, OB) (MZH).

Molecular data. BIN: BOLD:AAJ5816. The intraspecific average distance of the barcode region is 0.49 (n=12). The minimum distance to the nearest neighbour, *S. disjectella*, is 7.21 %. No barcode available for specimens from Siberia.

Distribution. Europe (Huemer & Karsholt 2010: 76), Russia: European part, South of Krasnoyarskiy krai (new record), Irkutsk region, Zabaikalskiy krai (Bidzilya *et al.* 1998: 47; Bidzilya 2002: 69; Ponomarenko 2008).

Scrobipalpa rebeli (Priessecker, 1915)

Figs 63, 122, 123, 161

Gelechia rebeli Priessecker 1914: 16.

Lita rebeli var. *fuscella* Klimesch, 1938: 45.

Scrobipalpa rebeli (Priessecker): Povolný, 1967: 213.

Scrobipalpa zouhari Povolný, 1984: 266. Syn. nov.

Material examined. 1 ♂, **Russia**, S-Buryatia, 50°58-59'N, 106°38-40'E, 550-600 m, Chikoy valley, Novoselenginsk vill. 10 km S, sand dunes/sandy steppe, 29.v.2006 (Nupponen) (gen. slide 221/16, OB) (Barcode TLMF Lep 28354) (NUPP); 2 ♂, 4 ♀, [Krasnoyarskiy krai], Minusinsk, Tagarskiy ostrov, 21–23.v.1924 (Filipjev) (gen. slides 193/08♂, 91/10♀, 250/15♂, 218/16♀, OB); 1 ♂, **Ukraine**, [Kherson region], Tchernomorskiy Nature Reserve, Ivano-Rybalchanskiy loc., 29–30.iv.1999 (Rutjan) (gen. slide 14/11, OB) (all ZMKU).

Molecular data. BIN: BOLD:AEC9652 (Russia: Buryatia), BIN: BOLD:ACL2449 (Italy: South Tirol). A genetically variable species. The intraspecific average distance of the barcode region of the Russian population is unknown (n=1), the intraspecific average distance of the barcode region of the Italian population (BIN: BOLD: ACL2449) is 0.0 % (n=2). The minimum distance between these clusters is 1.76% (p-dist) (Fig. 9).

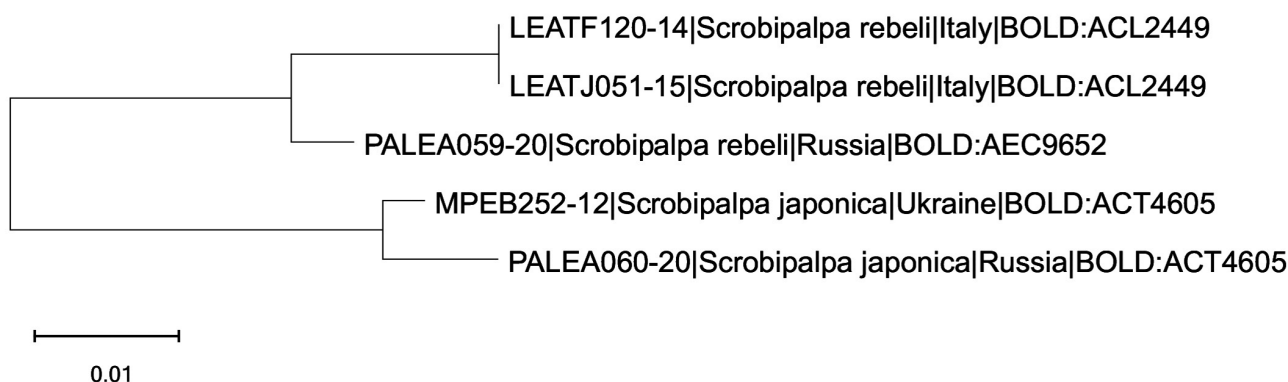


FIGURE 9. Neighbour-joining tree of *Scrobipalpa rebeli* (Priessecker, 1914) and *S. japonica* Povolný, 1977 in BOLD.

Distribution. Austria; northern Italy (Huemer & Karsholt 2010: 150); Ukraine (Budashkin 1987; Bidzilya & Budashkin 2003: 68); Russia: South of Krasnoyarskiy krai (Bidzilya 2002: 69), Buryatia (new record), China (Beijing). Records from China and Japan (Huemer & Karsholt 2010: 150) should be referred to *S. japonica*. Records from Ukraine: Crimea (Budashkin 1987) are partly based on misidentifications of *S. mixta*.

Remarks. *Scrobipalpa zouhari* Povolný, 1984 was described from a single male collected in the vicinity of Beijing (“Xi shan Birun shi” [= Xi shan, Biyun shi]). We did not study the holotype specimen, however the slide of the genitalia of the holotype (Zh. 5576, Povolný, remounted by OB, currently deposited in SMNK) leaves no doubt that *S. zouhari* Povolný, 1984 is syn. nov. of *S. rebeli* (Priessecker 1914).

Scrobipalpa japonica Povolný, 1977 sp. rev.

Figs 64, 65, 124, 125, 162

Scrobipalpa japonica Povolný 1977d: 222.

Type material examined. Holotype of *S. japonica* ♂, Yuni, 24.v.1961, Hokkaido, T. Kumata (gen. slide Jp.4844, D. Povolný) (SMNK).

Material examined. 1 ♀, **Russia**, S-Buryatia, 51°11-13'N, 106°10-12'E, 700 m, Hamar-Daban Mts, Murtoi river, Gusinoe Ozero vill. 6 km NW, forest steppe, 4.vi.2006 (Nupponen) (gen. slide 200/16, OB) (Barcode TLMF Lep 28355) (NUPP); 1 ♂, Tuva, 20 km E Mugur-Aksy, Tsagan-Shibetu ridge, 2200 m, 30.vi.2001 (Ustjuzhanin) (gen. slide 154/08, OB). 1 ♂, **Ukraine**, Crimea, Arabatskaya strelka, Lvovo env., 29.iv.2009, e. l. *Artemisia lercheana* Weber ex Stechm. (Budashkin) (gen. slide 216/16, OB) (BIDZ-00156); 1 ♂, Crimea, Kazantip, 10.v.1996

(Budashkin) (gen. slide 235/08, OB); 1 ♂, Donetsk reg., Khomutovskaya steppe Nature Reserve, 6.v.1996 (Bidzilya) (gen. slide Bdz. 9, D. Povolný) (all ZMKU).

Diagnosis. *Scrobipalpa japonica* is characterised externally by the greyish black forewing with a broad black mixed with brown longitudinal streak from base to apex. *Scrobipalpa rebeli*, *S. mixta* and *S. disjunctella* are very similar and can hardly be reliably separated without studying the genitalia. However, *S. mixta* is usually larger, *S. disjunctella* is more contrasting, the rather variable *S. rebeli* usually has a darker posterior margin of the forewing. The broadly rounded apically sacculus and vincular processes with indistinct tips in combination with the short, distinctly broadened apically cucullus are characteristic of the male genitalia. The most closely related *S. rebeli* differs in the longer uncus that is folded laterally, the narrower vincular processes and broader saccus. The sacculus and vincular processes are narrower in *S. mixta* and shorter in *S. disjunctella*. The female genitalia of *S. japonica* are recognized by the smooth sternum VIII with distinctly sclerotised medially and posteriorly subgenital plates and long, narrow signum. The related species differ additionally in the subgenital plates covered with a small foam sculpture (*S. disjunctella*, *S. mixta*) or microtrichia (*S. rebeli*).

Male genitalia (Figs 124–125). Uncus twice as long than broad, apically narrowed. Posterior margin rounded; gnathos short, weakly curved; tegumen moderately broad, anteromedial emargination broadly rounded, extending to 1/3 length; cucullus distinctly broadened in distal portion, with rounded apex, not extending beyond top of uncus; sacculus twice as broad as adjacent part of cucullus, apex broadly rounded with very small indistinct tip, extending nearly to half length of cucullus, of even width; vinculum slightly more than twice as broad as long, posterior margin with deep and narrow triangular basally and parallel-sided distally emargination, vincular process as broad and slightly shorter than sacculus, with short outwardly curved tip; saccus slender, extending far beyond top of pedunculus; distal portion of phallus broad, parallel-sided, apex pointed, apical arm narrow, down-curved, caecum slightly broader and about 1/3 length of phallic tube.

Female genitalia (Fig. 162). Papillae anales subovate, sparsely covered with short setae; apophyses posteriores four times as long as apophyses anteriores; segment VIII 1.5 times longer than broad, sternum VIII with triangular posteromedial emargination, subgenital plates subtriangular, distinctly broadened posteriorly, smooth except for weakly sclerotised patches along medial and posterior edges, ventromedial depression subtriangular distinctly broadened anteriorly, covered with fine microtrichia in posterior portion, anteriorly with large, deep triangular incision, subostial sclerites distinct, narrow; apophyses anteriores slightly shorter than segment VIII, straight; colliculum narrow, ring-shaped; ductus bursae moderately broad, corpus bursae elongate, basal plate of signum subtriangular, with several teeth on inner margin, distal hook long, narrow, curved at obtuse angle at 1/4.

Biology. The host plant in Ukraine is *Artemisia lerceana* Weber ex Stechm. (first host plant record). Adults have been recorded from late April to early May in Ukraine, late May in Japan, and June in Siberia. In Ukraine the species occurs in various steppe biotopes. The specimen bred from *A. lerceana* was found in extremely dry sand steppe.

Molecular data. BIN: BOLD:ACT4605. The intraspecific average distance of the barcode region is 1.12% (n=2) (Fig. 9). The minimum distance to the nearest neighbour, *S. buryatica* sp. nov. (BIN: BOLD:AEC7223), is 4.49%.

Distribution. Ukraine (Povolný 2001: 205); Russia: Tuva (Bidzilya 2009: 6), Buryatia (new record); China: Shaanxi (Bidzilya & Li 2010: 5); Japan (Povolný 2002: 51). The record from Crimea (Povolný 2001: fig. 28; Povolný 2002: pl. 30, fig. 273) should be referred to *S. mixta*.

Remark 1. *Scrobipalpa japonica* was described based on a single male collected in Hokkaido, Japan. Later the species was recorded from SE Ukraine (Povolný 2001: 205, fig. 27). The study of the holotype of *S. japonica* and additional material from China, southern Siberia and Ukraine showed that *S. japonica* differs clearly from *S. rebeli* in the genitalia of both sexes and should be taken out of synonymy of the latter, see also the genetic difference in fig 9.

Remark 2. Here we redescribe the male genitalia and describe the female genitalia of *S. japonica* for the first time.

Scrobipalpa ravida sp. nov.

Figs 66, 126, 127

Euscrobipalpa maniaca (Povolný, 1969): Povolný 2001: 205. Misidentification.

Type material. Holotype ♂, Zabaikalie, Nizhniy Tsasuchey vil. vicinity, sosnovyi bor, at light, 1.vii.1997 (A. Bidzilya, I. & O. Kostjuk) (gen. slide Bdz. 21, D. Povolný, remounted by OB) (ZMKU). Paratype: 1 ♂, Russia, S Buryatia, 51 09 N 106 16E, 550 m, lake Gusinoe ozero, steppe, 18.vi.2002 (Nupponen) (gen. slide 307/16, OB) (Barcode TLMF Lep 28356 [failed]) (NUPP).

Diagnosis. The species is characterised externally by the pale, greyish brown forewing with the fold and veins mottled with light brown. The male genitalia are distinguished in having a basally broad subtriangular vincular process in combination with a broad, inwardly curved sacculus. Similar species *S. gobica* Povolný, 1969 has both the sacculus and saccus slightly broader than the cucullus (compared with about twice as broad as the cucullus in *S. ravida* sp. nov.); *S. caucasica* (Povolný, 2001) differs in the longer and basally narrower sacculus, narrower vincular process and more slender phallus.

Description. Adult (Fig. 66). Wingspan 14.4–14.8 mm. Head, thorax and tegulae covered with grey brown-tipped scales, frons light grey to white, labial palpus upcurved, brown mixed with grey, palpomere 2 grey on inner and upper surface, scape brown mottled with grey, flagellomeres brown grey ringed. Forewing covered uniformly with pale brown-tipped scales, diffuse greyish black streak in fold, cilia grey brown-tipped. Hindwing and cilia light grey.

Male genitalia (Figs 126, 127). Uncus twice as long as broad at base, weakly narrowed apically, posterior margin rounded; gnathos long, slender, weakly curved; tegumen moderately elongate, anteromedial emargination from 1/4 to 1/3 length of tegumen; cucullus gradually curved, narrowest in medial 1/3, apex broadened, extending to top of uncus; sacculus twice as broad as cucullus in middle and 1/4–1/3 length of cucullus, of even width, inner margin nearly straight, outer margin rounded in distal half, with short inwardly curved pointed tip; vinculum twice as broad as long, anteromedial emargination V-shaped, vincular process subtriangular, at base as broad as sacculus, strongly narrowed towards rounded apex with outwardly curved pointed tip; saccus slender, pointed or weakly rounded apically, extending beyond top of pedunculus; distal portion of phallus moderately broad, parallel-sided, apex weakly pointed, apical arm slender, distinctly sinuate, caecum strongly inflated, about half length of phallic tube.

Variation. Two specimens slightly vary in the shape of the uncus, being narrowed either in the distal 1/3 or distal 1/2; saccus varies in length, slightly or distinctly extending beyond the top of the pedunculus.

Female. Unknown.

Biology. Adults were collected in steppe biotopes in mid June and early July.

Molecular data. No barcode available.

Distribution. Russia: Buryatia, Zabaikalskiy krai.

Etymology. The species name is derived from the Latin “*ravidus*” meaning grey, referring to uniformly grey forewing of the new species.

Scrobipalpa murinella (Duponchel, 1843)

Lita murinella Duponchel 1843: 458.

Gelechia culminicolella Staudinger, 1871: 306.

Gelechia excelsa Frey, 1880: 363.

Material examined. 2 ♂, **Russia**, Altai Mts, 50°16–20′N 87°50–55′E, Kuraisky hrebet, 2000–2500 m, 4.vii.2001 (T. & K. Nupponen) (gen. slide 333/16, OB) (NUPP); 1 ♂, Russia, Altai Republic, 45 km N of Ulagan vill., Chulyshman valley, 51°01′56″N; 88°00′43″E, grassy steppe, rocks, 600 m, 26–27.vi.2019 (Šumpich) (Barcode NMPC-LEP-0941); 1 ♀, Russia, Tuva rep., 50°50′N 94°19′E, 2175 m, E. Tannu-Ola mts, timberline (*Larix*)/steppe, 17.vi.1995 (Jalava & Kullberg) (gen. slide 144/21, OB) (MZH).

Molecular data. BIN: BOLD:AAH9720. The intraspecific average distance of the barcode region is 0.63% (n=10). The minimum distance to the nearest neighbour, unidentified *Scrobipalpa* from Canada (BOLD:AAG9133), is 2.68%.

Distribution. Europe (northern parts and mountains) Russia: European part, Altai, Tuva (new record), Irkutsk region (Bidzilya 2002: 69; Ponomarenko 2008: 96).

Scrobipalpa salinella (Zeller, 1847)

Gelechia salinella Zeller 1847: 853.

Lita zernyella Rebel, 1918: 87.

Gnorimoschema corsicanum Gregor & Povolný, 1954: 94.

Gnorimoschema ignotum Gregor & Povolný, 1954: 94.

Scrobipalpa trebujenae Povolný, 1977: 146.

Material examined. 1 ♂, Russia, S-Buryatia, 51°28'N 106°33'E, 600 m, Gusinoozersk vill., 5 km NNE lake Solyonoe, salt marsh/steppe, 26.vi.2002 (Nupponen) (gen. slide 131/17, OB) (Barcode TLMF Lep 28352 [failed]); 1 ♂, same data as for preceding (gen. slide 163/16, OB) (Barcode TLMF Lep 28338 [failed]); 4 ♂, 6 ♀, same data as for preceding (gen. slide 164/16, OB) (all NUPP).

Molecular data. *S. salinella* shares BIN [BOLD:AAF1193 (n=25, of which 21 public) with *S. salicorniae* (Hering, 1889). Moreover, *S. salinella* is most probably a complex of several species, some of them hitherto undescribed (cf. Fig. 10). The minimum distance of *S. salinella* (n=9) to the nearest neighbour, *S. salicorniae* (n=12), is 1.27%. The intraspecific average distance of *S. salinella* is 0.35% (Fig. 10).

Distribution. South Europe, North Africa, Middle East, Russia: South of European part, southern Ural, Novosibirsk region, Altaiskiy krai, Buryatia (new record); Kazakhstan, Mongolia (Povolný 1996: 36, 2002: 67; Bidzilya 2005:15; Ponomarenko 2008: 97; Junnilainen *et al.* 2010: 50; Huemer & Karsholt 2010: 178).

Scrobipalpa ochronerva sp. nov.

Figs 67, 128

Type material. Holotype ♂, Russia, S-Buryatia, 51°28'N 106°33'E, 600 m, Gusinoozersk vill., 5 km NNE lake Solyonoe, salt marsh/steppe, 26.vi.2002 (Nupponen) (gen. slide 383/16, OB) (Barcode TLMF Lep 28351) (NUPP).

Diagnosis. A greyish brown species with three ochreous-brown spots in cell and contrasting ochreous-brown veins. *Scrobipalpa buryatica* sp. nov. and *S. spumata* have a similar wing pattern but usually predominantly light brown rather than greyish brown, and spots in cell are absent. Some specimens of the rather variable *S. salinella* and *S. salicorniae* are also very similar to *S. ochronerva* sp. nov., but differ in the more distinct and larger spots in the cell. Distinctly narrowed apically uncus, comparatively broad tegumen in combination with the broad sacculus and short and broad vincular process separate *S. ochronerva* sp. nov. from species of the *S. salinella-instabilella* complex. In this complex, *S. salicorniae* has the most similar male genitalia, but the uncus is twice as long as broad (1.5 times longer in *S. ochronerva* sp. nov.), the hump on the inner margin of the sacculus is absent and the posteromedial emargination of vinculum is narrower.

Description. Adult (Fig. 67). Wingspan 15.4 mm. Scales on head, thorax and tegulae grey, brown in distal part and tipped with grey, frons grey, labial palpus upcurved, uniformly greyish brown except off-white basal patch on inner surface of palpomere 2, scape greyish brown, antennal palpomeres greyish brown with indistinct whitish rings. Forewing greyish brown, three ochreous-brown spots in cell, veins distinctly mottled with ochreous-brown, cilia grey brown-tipped. Hindwing grey with dark veins, cilia light grey.

Male genitalia (Fig. 128). Uncus tongue-shaped, gradually narrowed posteriorly, 1.5 times longer than broad at base; gnathos hook moderately long, weakly curved; culcitula distinct, elongate; tegumen slightly longer than broad, anteromedial emargination extending to 1/3 of its length, transition to uncus indistinct; cucullus slender, gradually curved, of even width except slightly broadened at apex, extending to 3/4 length of uncus; sacculus 1/5–1/4 length and 1.5–2 times width of cucullus, nearly parallel-sided, inner margin with short hump before pointed inwardly curved tip; vinculum twice as broad than long, posteromedial emargination broad, V-shaped, vincular process subtriangular, with outwardly curved pointed tip, distinctly shorter and as broad at base as sacculus; saccus broad at base, evenly tapered apically, slightly extending beyond top of pedunculus; phallus stout, caecum weakly inflated, strongly sclerotised along ventral margin, apical cornutus straight, distinct.

Female. Unknown.

Biology. The adult was collected in late June in a salt marsh biotope at an altitude of 600 m.

Molecular data. BIN: BOLD:AEC7268. The intraspecific average distance is unknown (n=1). The minimum distance to the nearest neighbour, *S. salicorniae* (BIN: BOLD:AAF1193), is 3.21% (p-dist); the minimum distance of BOLD:AAF1193 to the nearest neighbour, an unidentified *Scrobipalpa* from Spain and Italy belonging to the halophilous *S. salinella* group (BIN: BOLD:AAF1193), is 3.53% (p-dist) (Fig. 10).

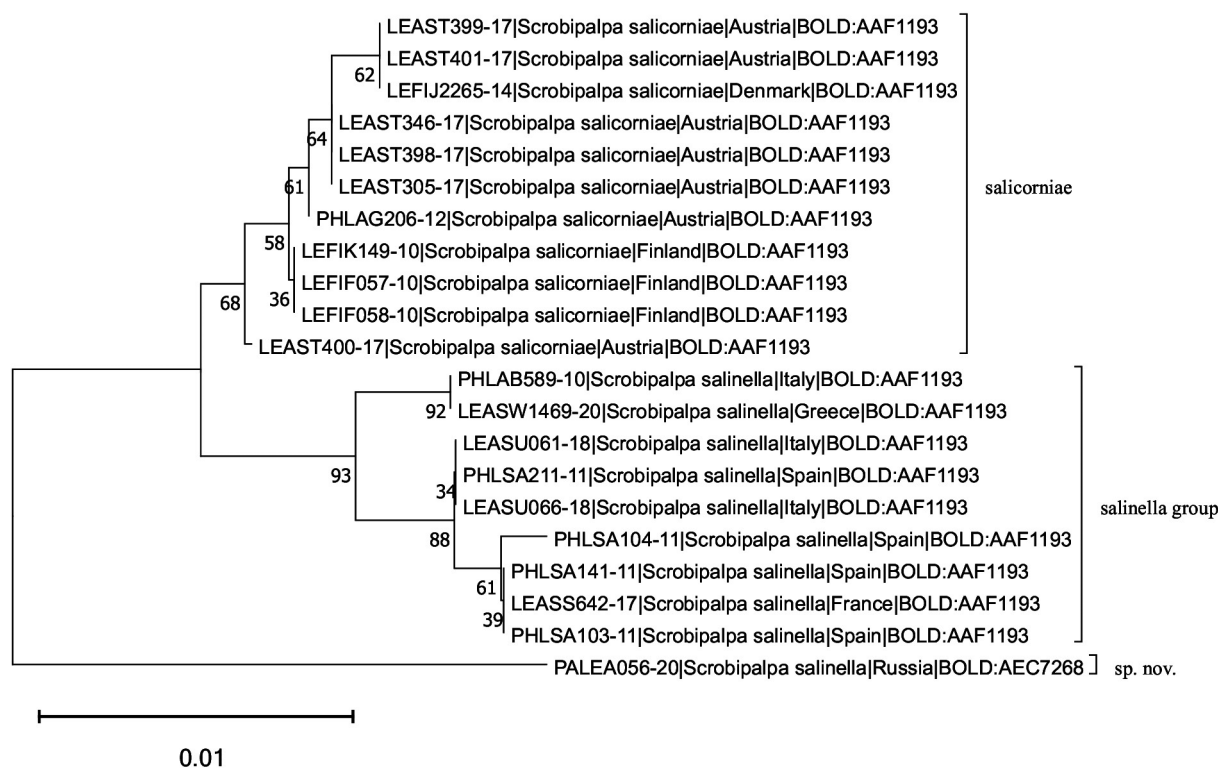


FIGURE 10. Neighbour-joining tree of *Scrobipalpa ochronerva* sp. nov. and the closest species, *S. salicorniae* (Hering, 1889) and hitherto unsolved species complex of *S. salinella* group, in BOLD.

Distribution. Russia: Buryatia.

Etymology. The specific name reflects the ochreous veins that are distinctive for the new species

Scrobipalpa ochraeata sp. nov.

Figs 68–70, 129, 163, 164

Type material. Holotype ♀, Russia, S-Buryatia, 51°11–13'N, 106°10–12'E, 700 m, Hamar-Daban Mts, Murtoi river, Gusinoe Ozero vill. 6 km NW, forest steppe, 20.vi.2002, K. Nupponen (gen. slide 325/16, OB). Paratypes: 1 ♀, same data as for holotype but 19.vi.2002 (gen. slide 400/16, OB) (Barcode TLMF Lep 28316); 1 ♀, same data as for preceding (gen. slide 178/16, OB) (Barcode TLMF Lep 28315) (all NUPP).

Material not included in the type series (see under Remarks). 1 ♂, Russia, Tuva rep., 50°16'N 94°54'E, 1250 m, ca 25 km W Erzin, steppe/stony slopes, 7–11.vi.1995 (Jalava & Kullberg) (gen. slide 296/16, OB) (MZH).

Diagnosis. The new species can be recognized externally by the light brown forewing mottled with ochreous in fold, below costal margin and along veins in subapical 1/3. *Scrobipalpa sinica* is very similar but has a more distinct ochreous irroration along the veins. A broad ventromedial depression, short apophyses anteriores, short ductus bursae and long signum hook are characteristic of the female genitalia of the new species. *Scrobipalpa usingeri* Povolný, 1969 also has a broad anteromedial depression, but clearly differs in the longer apophyses anteriores and segment VIII being more weakly narrowed posteriorly.

Description. Adult (Figs 68–70). Wingspan 11.2–12.0 mm. Head greyish black, labial palpus upcurved, light grey mixed with black on outer margin, scape dark brown, flagellomeres brown narrowly ringed with light grey.

Thorax and tegulae greyish black. Forewing greyish black mixed with ochreous-brown from base to 2/3 of dorsal margin and before apex, fold and subcostal vein light brown, diffuse brown subapical streak from corner of cell to wing apex, indistinct brown subapical fascia at 3/4, cilia grey black-tipped. Hindwing and cilia grey.

Male. Unknown (see under Remarks).

Female genitalia (Figs 163, 164). Papillae anales subovate, sparsely covered with short setae; apophyses posteriores 6 times as long as apophyses anteriores, segment VIII trapezoidal, distinctly narrowed apically, basally as long as broad, posterior margin of sternum VIII with broad medial emargination, anterior margin weakly edged; subgenital plates 1/6 width of sternum VIII, with patch of foam sculpture at base of apophyses anteriores; ventromedial depression broad, covered with fine microtrichia, folded medially; lobes of anteromedial depression broad, anteriorly rounded and covered with foam sculpture, not extending beyond anterior edge of sternum VIII, with deep and broad triangular anteromedial gap; apophyses anteriores 1/4 length of segment VIII, straight; ductus bursae short, narrow of even width, colliculum short; corpus bursae clearly distinguished from ductus bursae, egg-shaped, slightly shorter than ductus bursae, signum on right side near entrance of corpus bursae, basal plate narrow with one small tooth, distal hook narrow, long, weakly curved in middle, pointed.

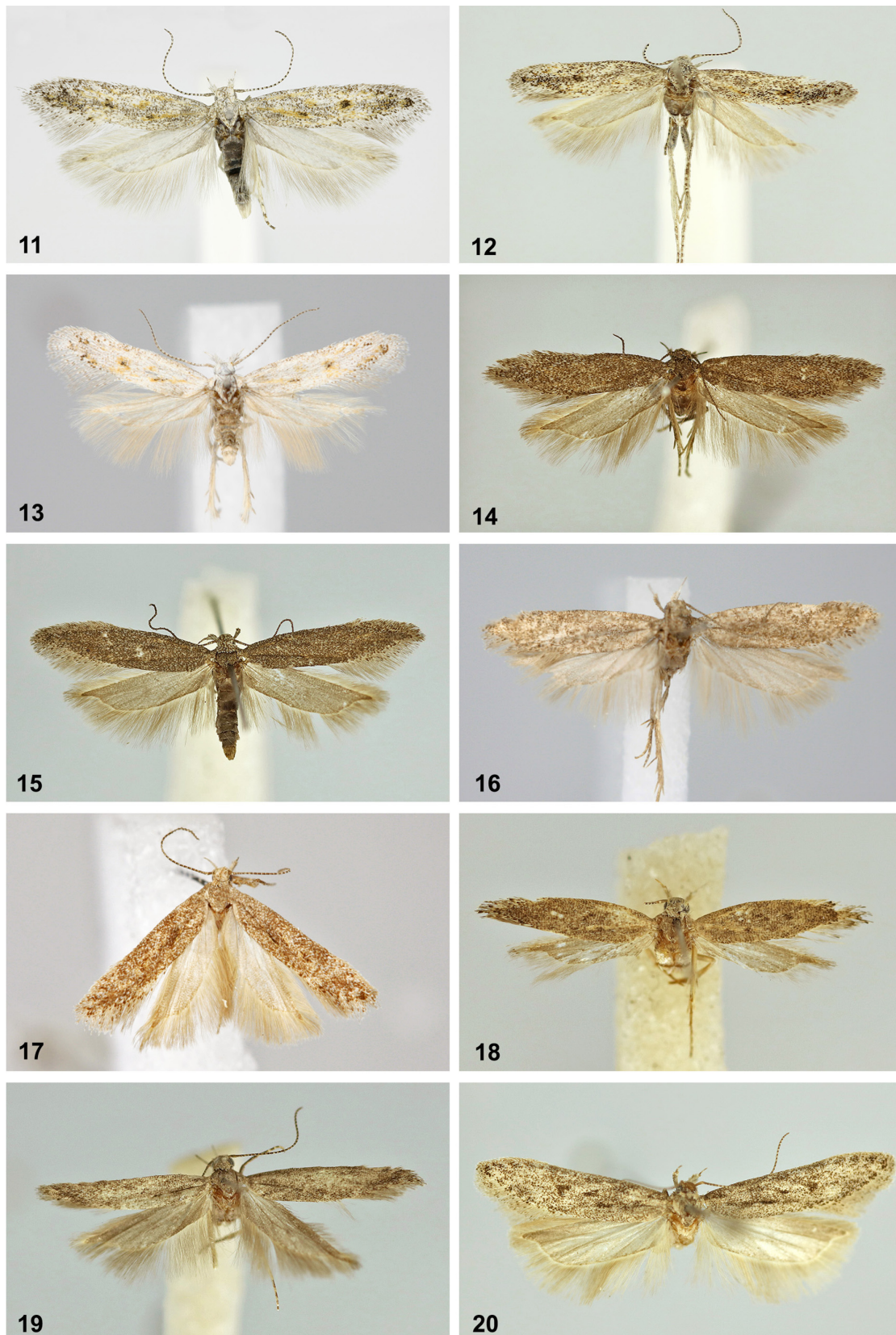
Biology. Adults have been collected in June in steppe biotopes at an altitude of 700 m.

Molecular data. BIN: BOLD:AEC8608. The intraspecific average distance of the barcode region is unknown (n=1). The minimum distance to the nearest neighbour, *S. karadaghi* (BIN: BOLD:ADR5475), is ca 4.11%.

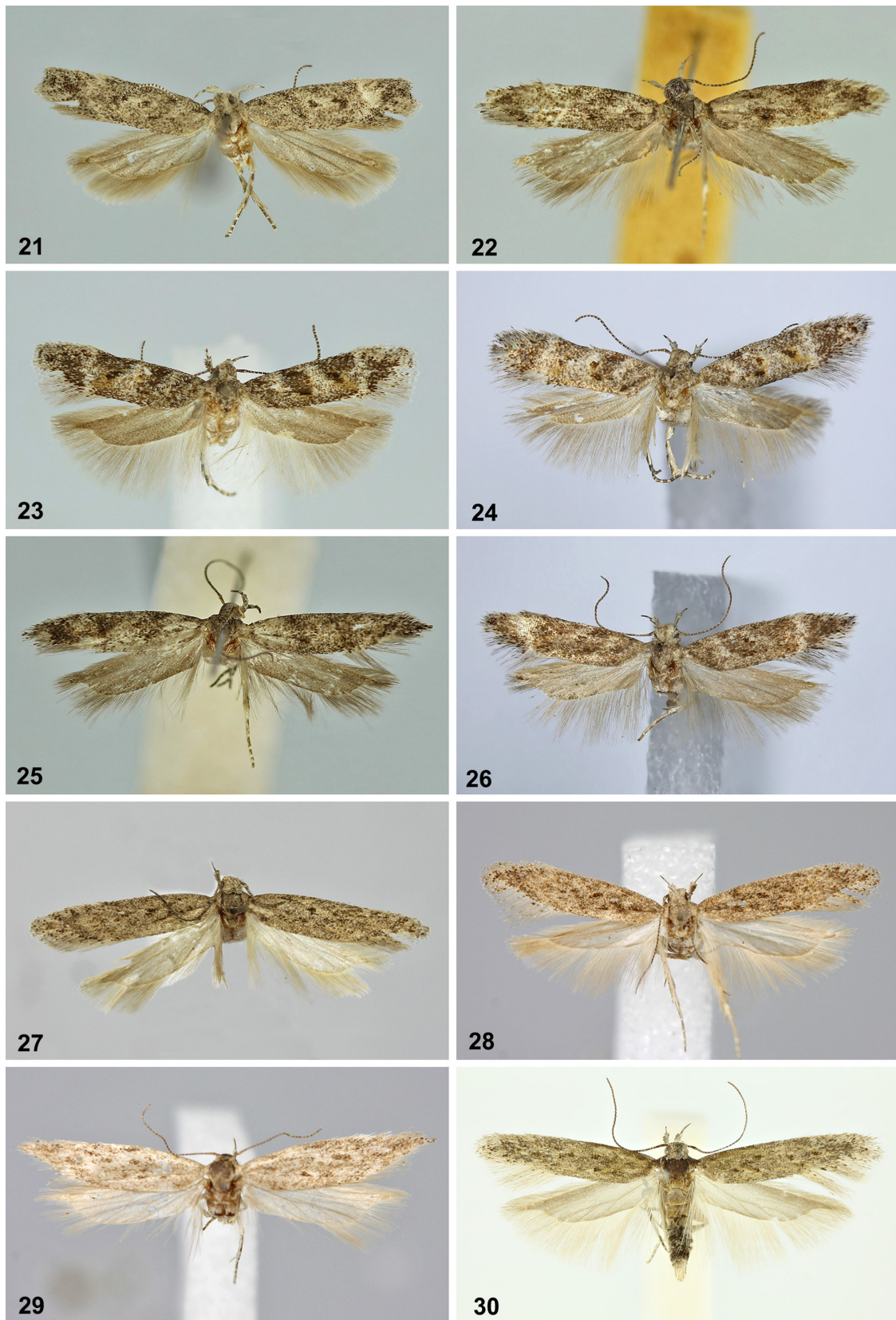
Distribution. Russia: Buryatia.

Etymology. The species name reflects the ochreous pattern of the forewing of the new species.

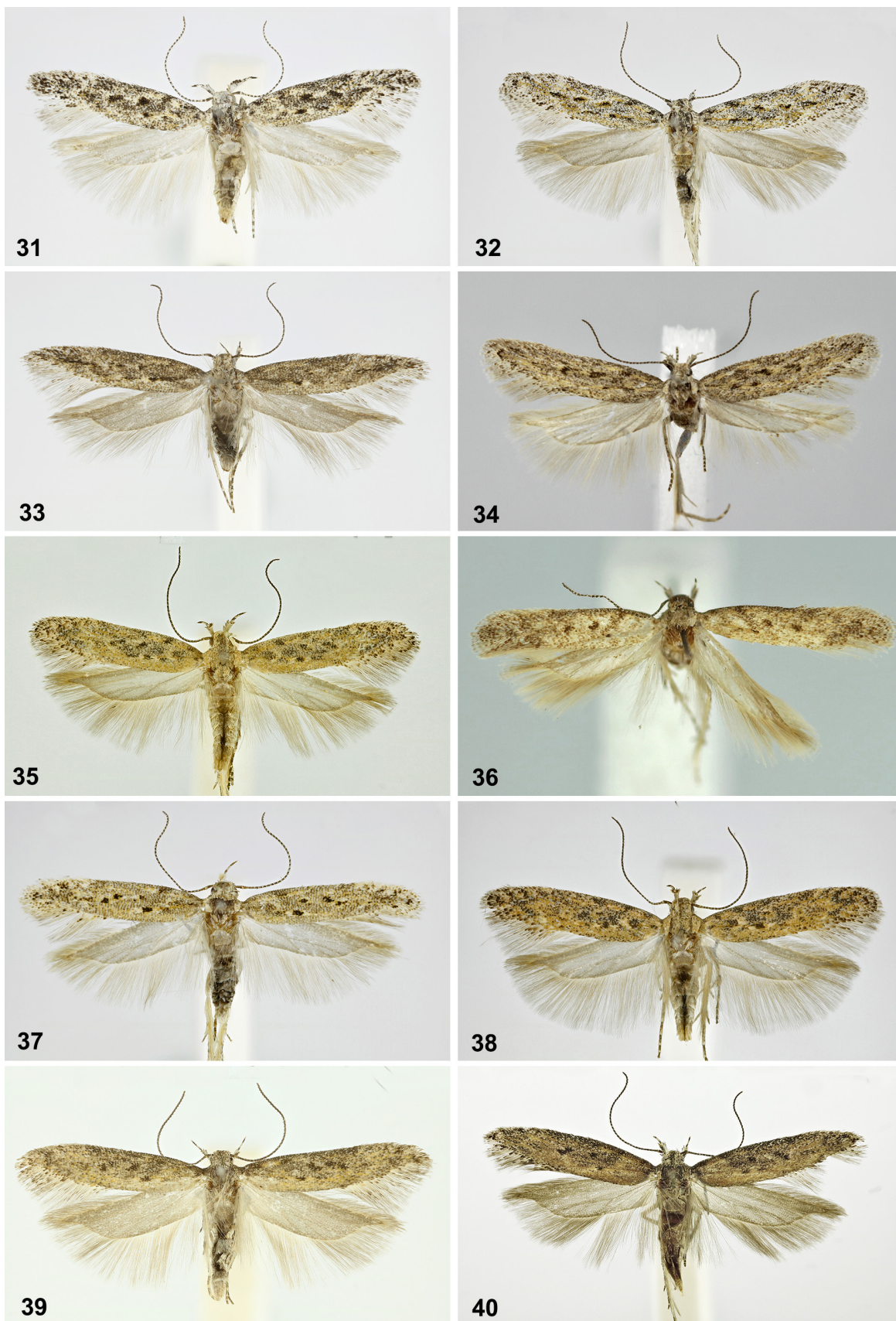
Remarks. A single male from Tuva (Figs 70, 129) matches externally the type specimens of *S. ochraeata* sp. nov., and we illustrate it here as a possible male of this species. However, this suggestion needs verification by study of additional specimens including females from Tuva.



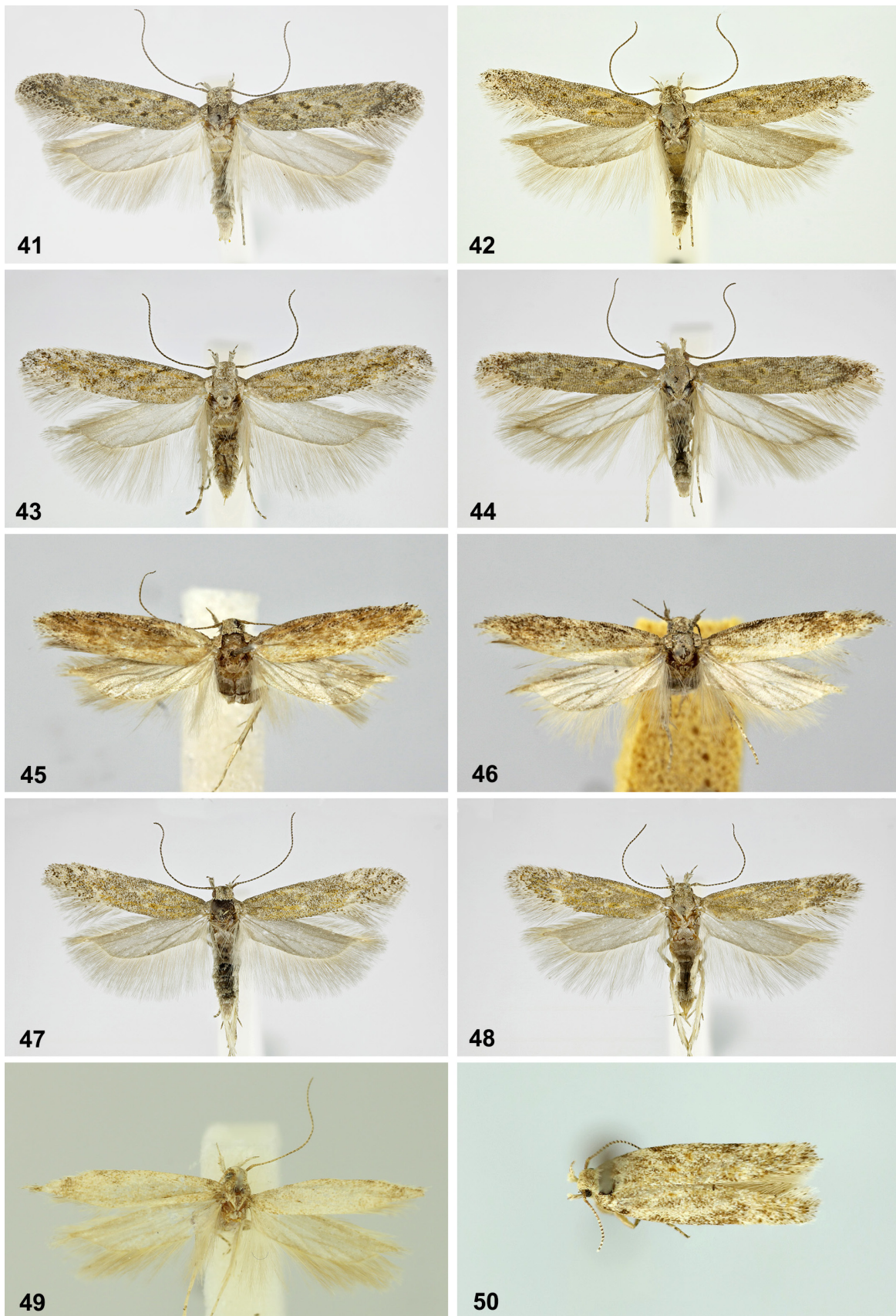
Figures 11–20. *Scrobipalpa* spp., adults. 11–13. *S. nupponeni* sp. nov. 11. HT, male, Altai. 12. PT, male, Altai (gen. slide 258/20, OB). 13. PT, male, Buryatia. 14, 15. *S. rutjani* sp. nov., Kyrgyzstan. 14. HT, male (gen. slide 34/16, OB). 15. PT, male. 16. *S. superstes*, male, Altai (gen. slide 259/16, OB). 17. *S. tannuoella* sp. nov., HT, male, Tuva (gen. slide 320/16, OB). 18, 19. *S. intima*, Zabaikalskiy krai. 18. HT, female (gen. slide Bdz. 35, D. Povolný). 19. PT, male (gen. slide Bdz. 51, D. Povolný). 20. *S. punctulata*, male, Buryatia, (gen. slide 263/16, OB).



Figures 21–30. *Scrobipalpa* spp., adults. 21. *S. punctulata*, female, Buryatia (gen. slide 385, OB). 22–24. *S. chitensis*. 22. HT, male, Zabaikalskiy krai (gen. slide Bdz. 48, D. Povolný). 23. Male, Buryatia (gen. slide 155/16, O. Bidzilya). 24. Female, Buryatia (gen. slide 173/21, OB). 25, 26. *S. bidzilyai*. 25. HT, male, Zabaikalskiy krai (gen. slide Bdz. 45, D. Povolný). 26. Male, Buryatia (gen. slide 196/19, O. Bidzilya). 27–29. *S. tenebrata*. 27. HT, male, Zabaikalskiy krai (gen. slide Bdz. 11, D. Povolný). 28. Male, Buryatia (gen. slide 335/16, OB). 29. Female, China (gen. slide 226/16, OB). 30. *S. frugifera*, male, Altai.



Figures 31–40. *Scrobipalpa* spp., adults. 31, 32. *S. zaitzevi*, Altai. 31. Female. 32. Male. 33. *S. lobata* sp. nov., Altai, PT, male. 34. *S. truncata*, male, Buryatia (gen. slide 258/16, OB). 35. *S. marmorella*, female, Altai (gen. slide 307/21, OB). 36. *S. kullbergi* sp. nov., HT, male, Tuva (gen. slide 311/16, OB). 37, 38. *S. inexplicitata* sp. nov., PT, Altai. 37. Male. 38. Female. 39, 40. *S. cinerosella*, Altai. 39. Male. 40. Female.



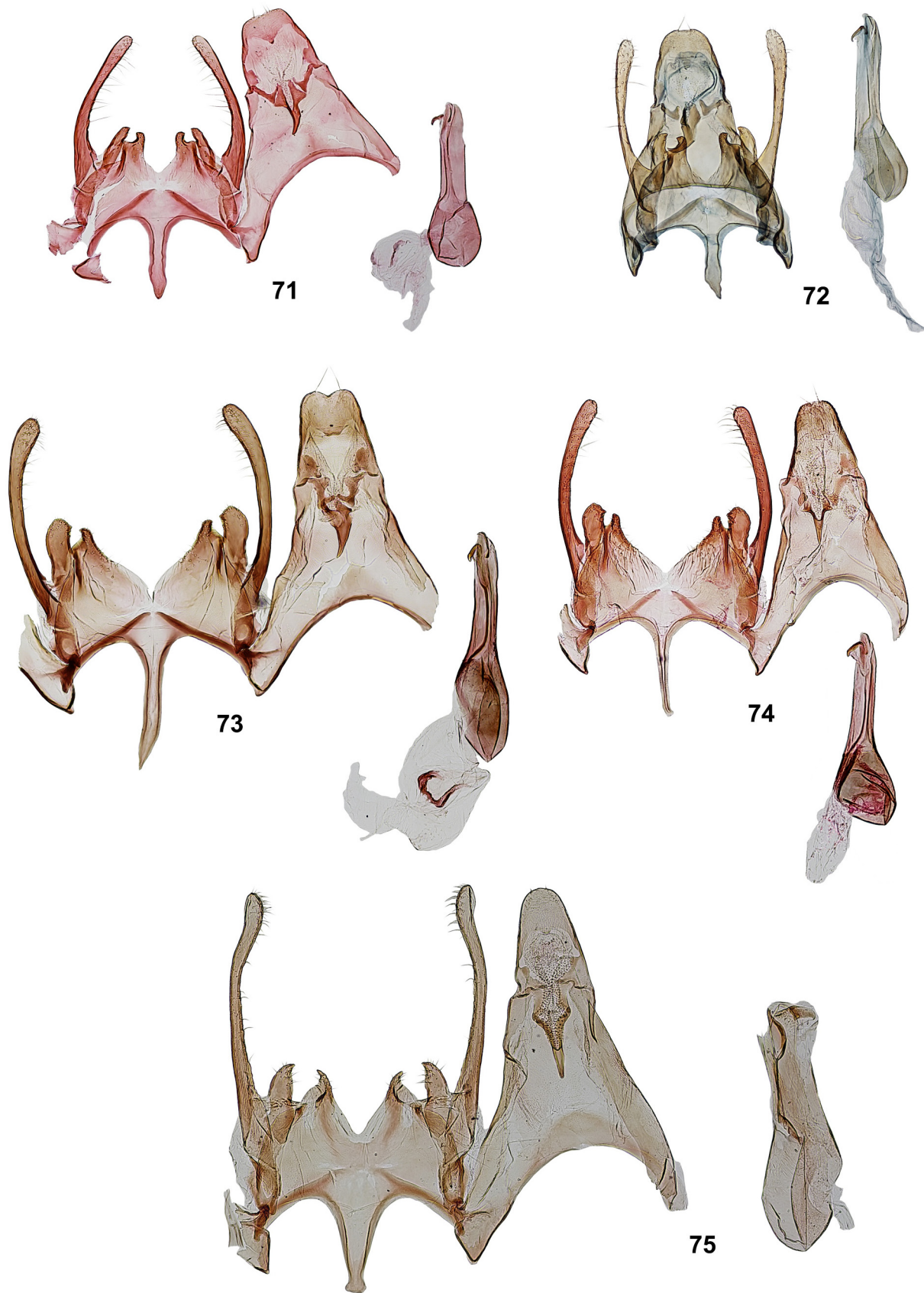
Figures 41–50. *Scrobipalpa* spp., adults. 41. *S. inferna*, male, Altai. 42, 43. *S. altubura* sp. nov., Altai. 42. HT, male (gen. slide 175/21, OB). 43. PT, female. 44. *S. mongolica*, male, Altai. 45, 46. *S. ferruginosa*, females, Zabaikalskiy kraj. 45. HT (gen. slide Bdz. 8, D. Povolný). 46. HT of *E. pinosa* (gen. slide Bdz. 50, D. Povolný). 47, 48. *S. krasnogorka* sp. nov., Altai. 47. HT, male. 48. PT, female. 49, 50. *S. similis*, Mongolia. 49. HT, male (gen. slide 4251, D. Povolný). 50. Female (gen. slide 245/15, OB).



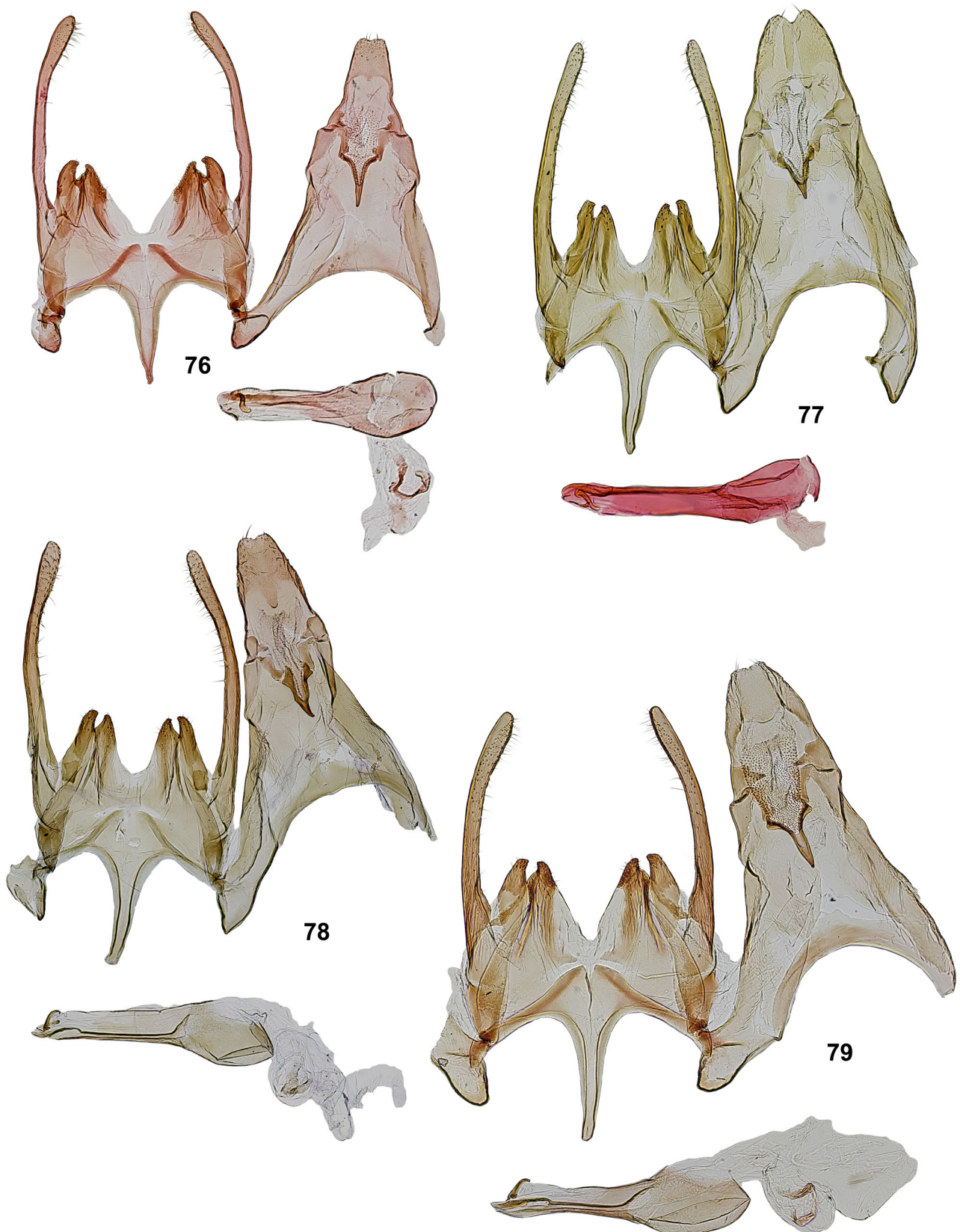
Figures 51–60. *Scrobipalpa* spp., adults. 51, 52. *S. similis*, Zabaikalskiy krai. 51. HT of *S. kyrana*, female (gen. slide Bdz. 34, D. Povolný). 52. Male (gen. slide 31/07, OB). 53, 54. *S. buryatica* sp. nov., males, Buryatia. 53. HT (gen. slide 378/16, OB). 54. PT (gen. slide 176/16, OB). 55. *S. spumata*, male, Tuva (gen. slide 199/19, OB). 56. *S. mixta*, male, Tuva (gen. slide 197/16, OB). 57, 58. *S. albiflava* sp. nov., males. 57. HT, Tuva (gen. slide 203/16, OB). 58. PT, Altai (gen. slide 265/20, OB). 59. *S. occulta*, HT, male, Turkey (gen. slide Gl. 4340, D. Povolný). 60. *S. ochrogera*, PT, male, Kyrgyzstan (gen. slide 169/16, OB).



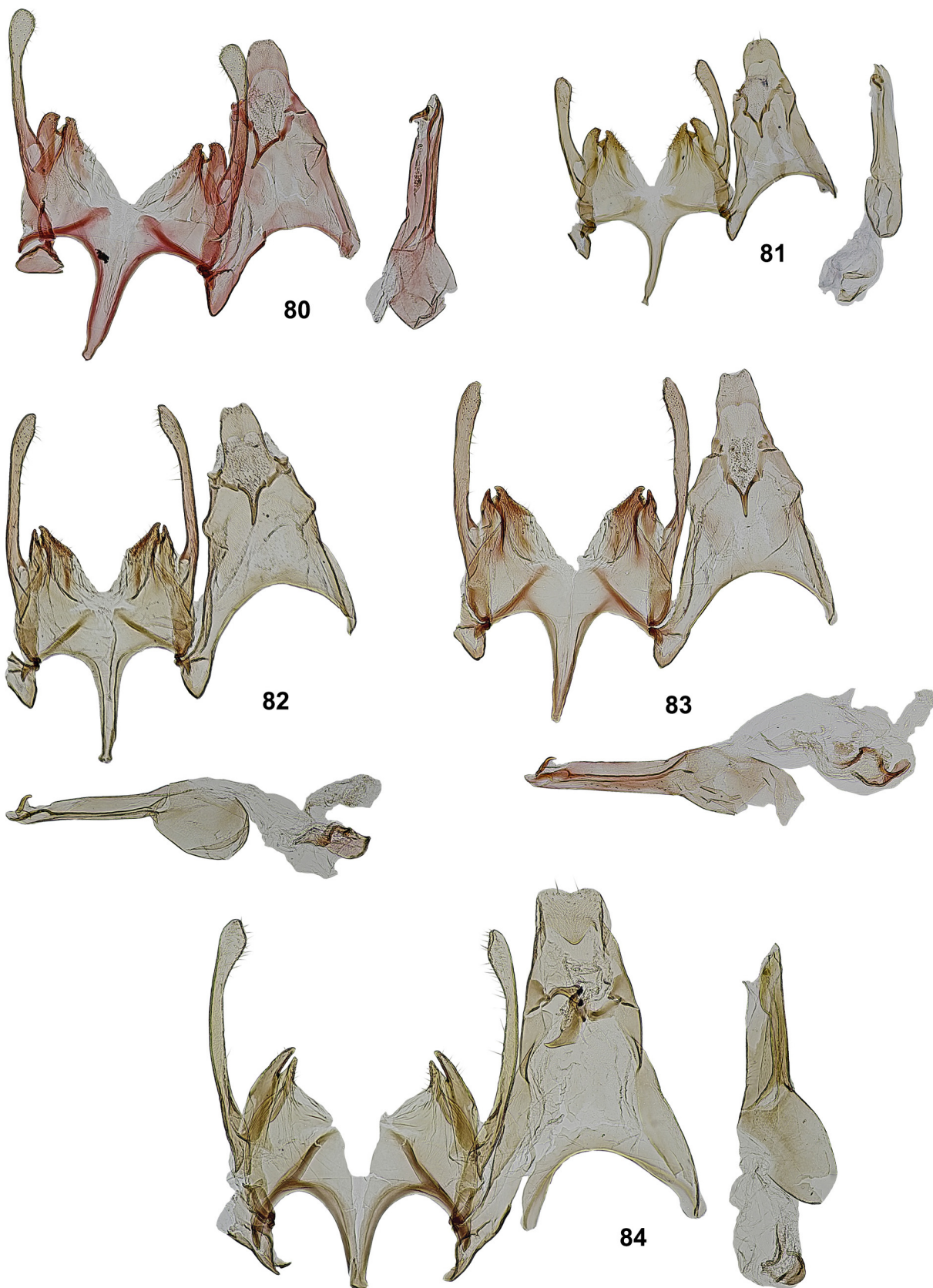
Figures 61–70. *Scrobipalpa* spp., adults. 61, 62. *S. sibirica*, Altai. 61. HT, male (gen. slide 8/16, OB). 62. Female. 63. *S. rebeli*, male, Buryatia (gen. slide 221/16, OB). 64, 65. *S. japonica*. 64. HT, male, Japan Kumata (gen. slide Jp.4844, D. Povolný). 65. Female, Buryatia (gen. slide 200/16, OB). 66. *S. ravida* sp. nov., male, HT, Zabaikalskiy krai (gen. slide Bdz. 21, D. Povolný). 67. *S. ochronerva* sp. nov., male, HT, Buryatia (gen. slide 383/16, OB). 68–70. *S. ochraeata* sp. nov., females, Buryatia. 68. HT (gen. slide 325/16, OB). 69. PT (gen. slide 178/16, OB). 70. Possible male, Tuva (gen. slide 296/16, OB).



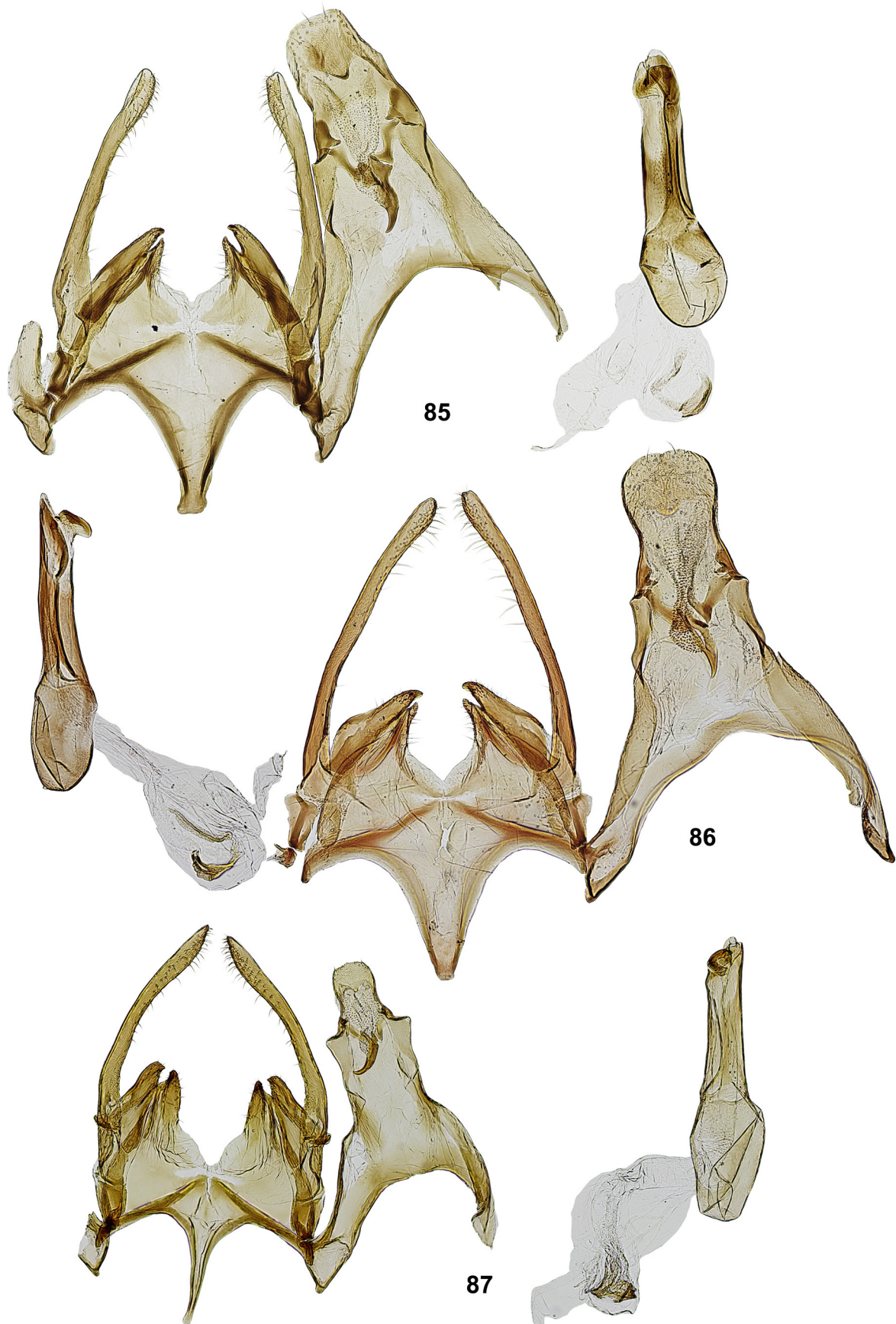
Figures 71–75. *Scrobipalpa* spp., male genitalia. 71, 72. *Scrobipalpa nupponeni* sp. nov. 71. PT, Buryatia (gen. slide 175/16, OB). 72. PT, Altai (gen. slide 282/20, OB). 73, 74. *S. rutjani* sp. nov. 73. HT, Kyrgyzstan (gen. slide 34/16, OB). 74. PT, Tuva (gen. slide 330/16, OB). 75. *S. superstes*, Altai (gen. slide 259/16, OB).



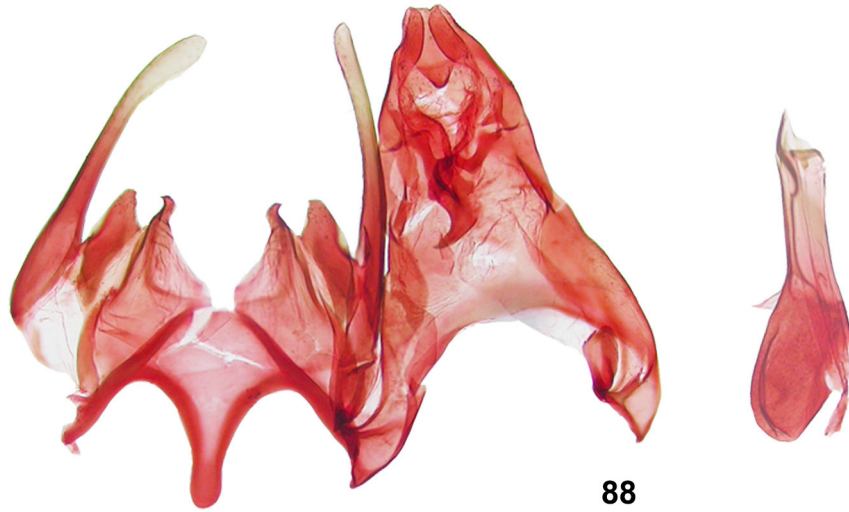
Figures 76–79. *Scrobipalpa* spp., male genitalia. 76. *S. tannuoella* sp. nov., HT, Tuva (gen. slide 320/16, OB). 77, 78. *S. intima*. 77. PT, Zabaikalskiy krai (gen. slide Bdz. 51, D. Povolný). 78. Zabaikalskiy krai (gen. slide 222/19, OB). 79. *S. punctulata*, Buryatia (gen. slide 263/16, OB).



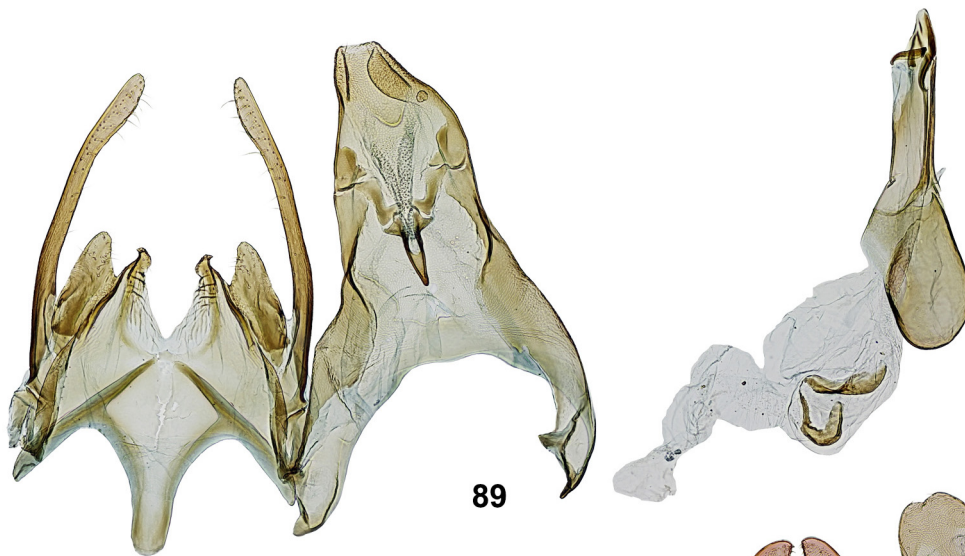
Figures 80–84. *Scrobipalpa* spp., male genitalia. 80, 81. *S. chitensis*, 80. HT, Zabaikalskiy krai (gen. slide Bdz. 48, D. Povolný). 81. Buryatia (gen. slide 213/19, OB). 82, 83. *S. bidzilyai*. 82. HT, Zabaikalskiy krai (gen. slide Bdz. 45, D. Povolný). 82. Buryatia (gen. slide 200/15, OB). 84. *S. tenebrata*, HT, Zabaikalskiy krai (gen. slide Bdz. 11, D. Povolný).



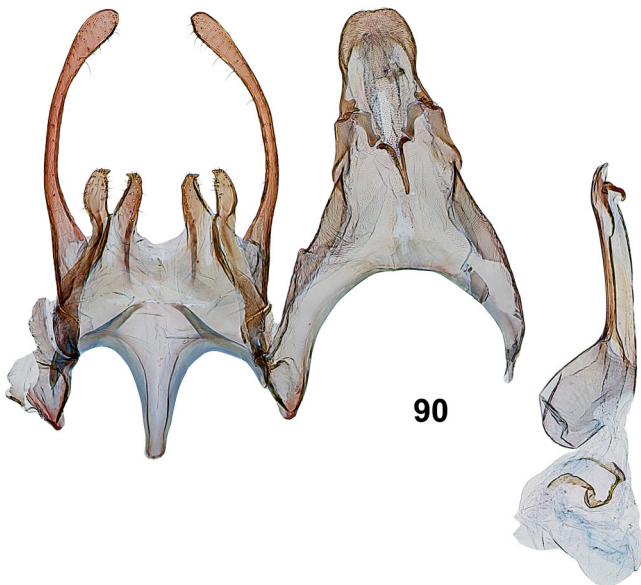
Figures 85–87. *Scrobipalpa* spp., male genitalia. 85, 86. *S. tenebrata*. 85. Zabaikalskiy krai (gen. slide 241/15, OB). 86. China (gen. slide 227/16, OB). 87. *S. frugifera*, Altai (gen. slide 186/21, OB).



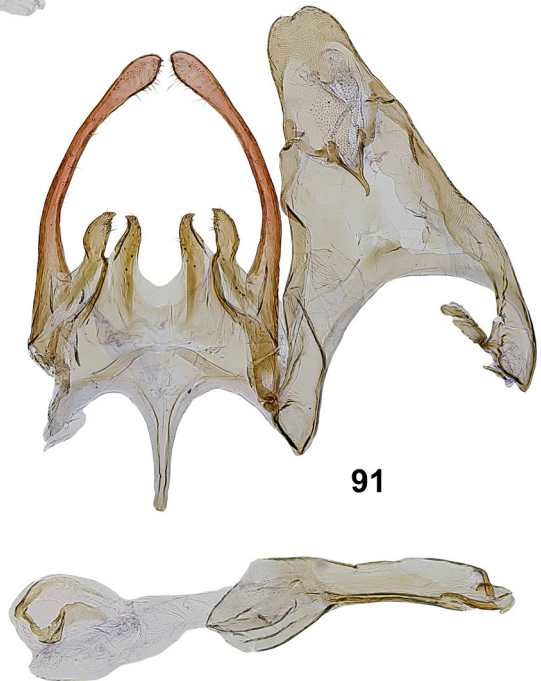
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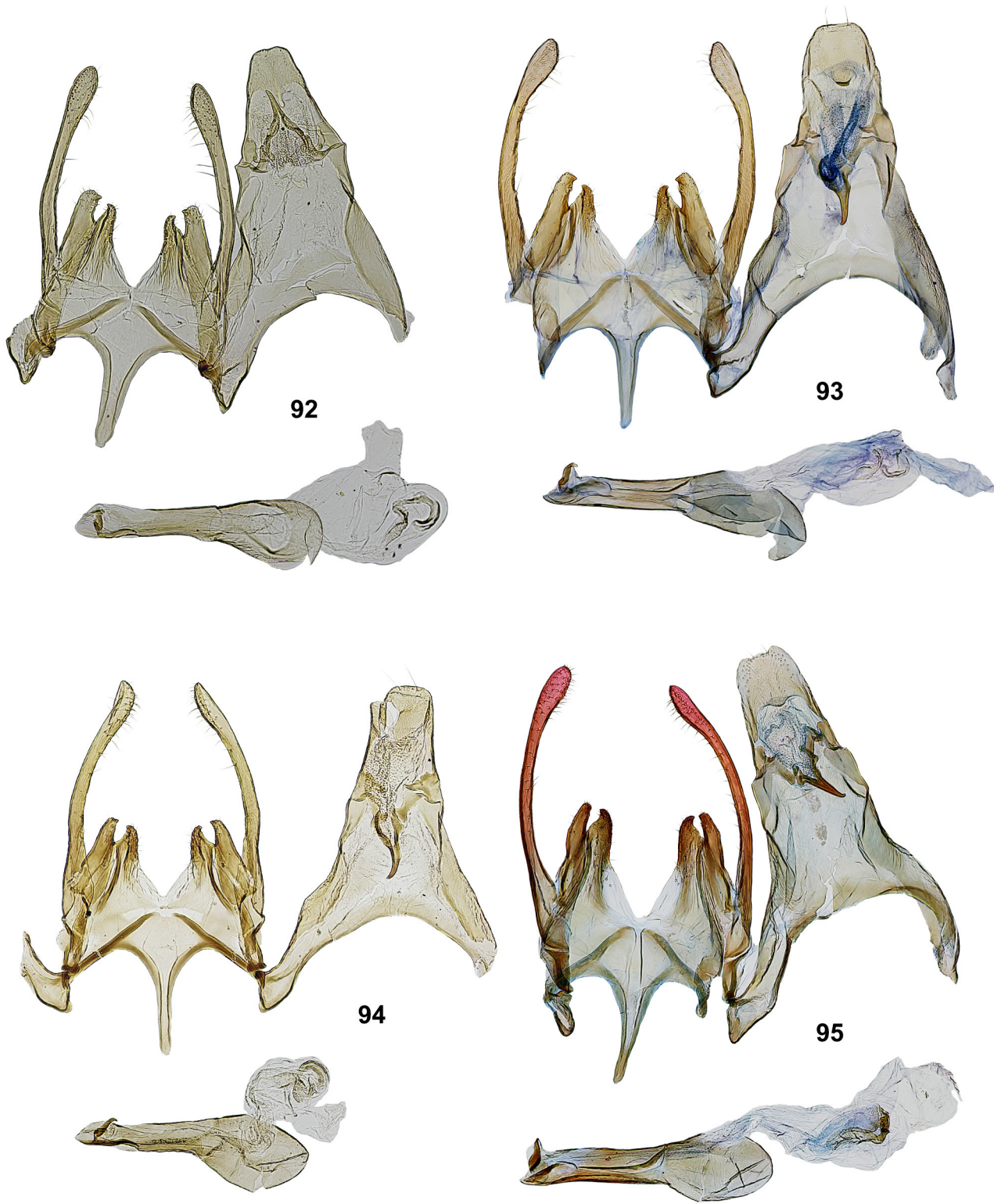


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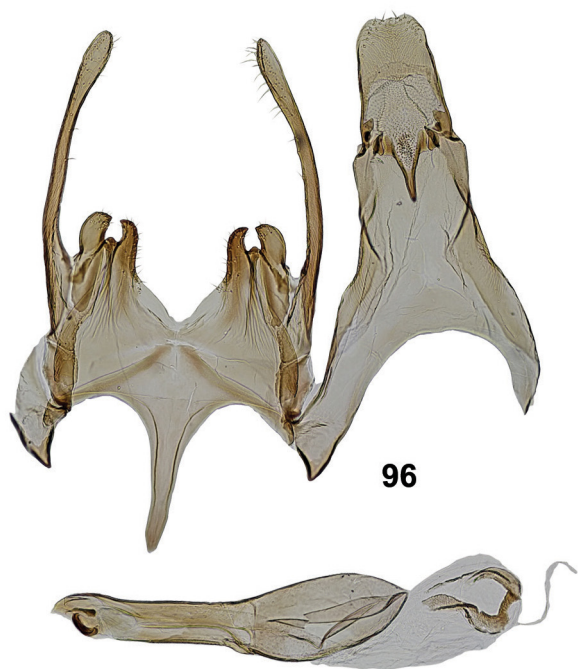


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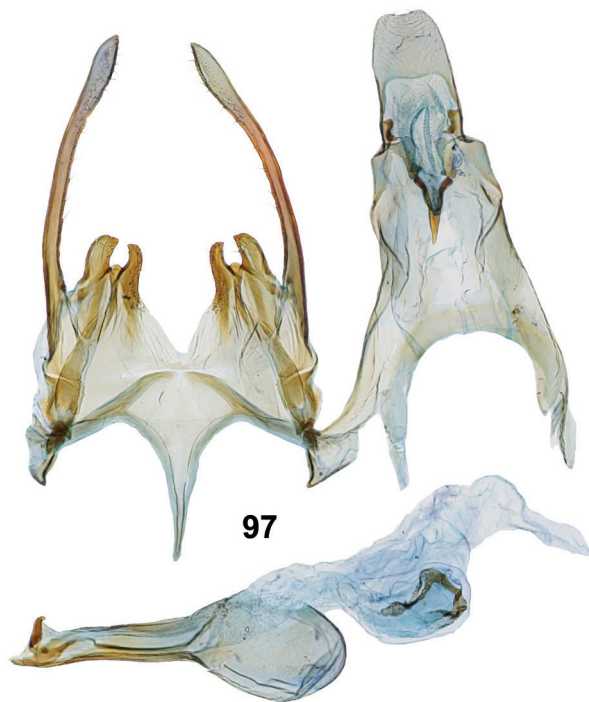
Figures 88–91. *Scrobipalpa* spp., male genitalia. 88, 89. *S. zaitzevi*. 88. HT, Mongolia (gen. slide 176/08, OB). 89. Russia, Altai (gen. slide 269/20, OB). 90, 91. *S. lobata* sp. nov. 90. PT, Altai (gen. slide 282/21, OB). 91. PT, Buryatia (gen. slide 203/19, OB).



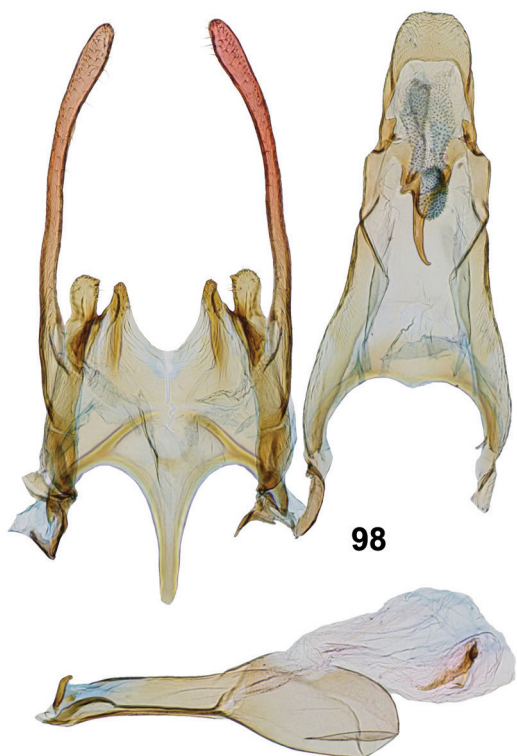
Figures 92–95. *Scrobipalpa* spp., male genitalia. 92–94. *Scrobipalpa truncata*. 92. HT, Kazakhstan (gen. slide Hk. 5408, D. Povolný). 93. Buryatia (gen. slide 238/19, OB). 94. Altai (gen. slide 240/15, OB). 95. *S. marmorella*, Altai (gen. slide 179/21, OB).



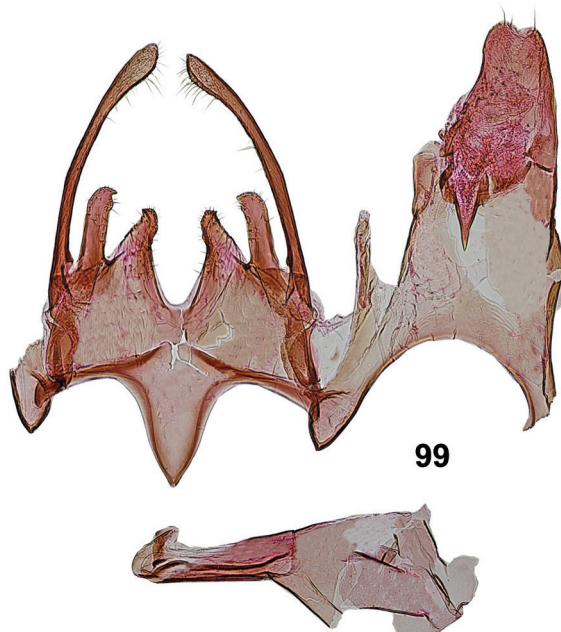
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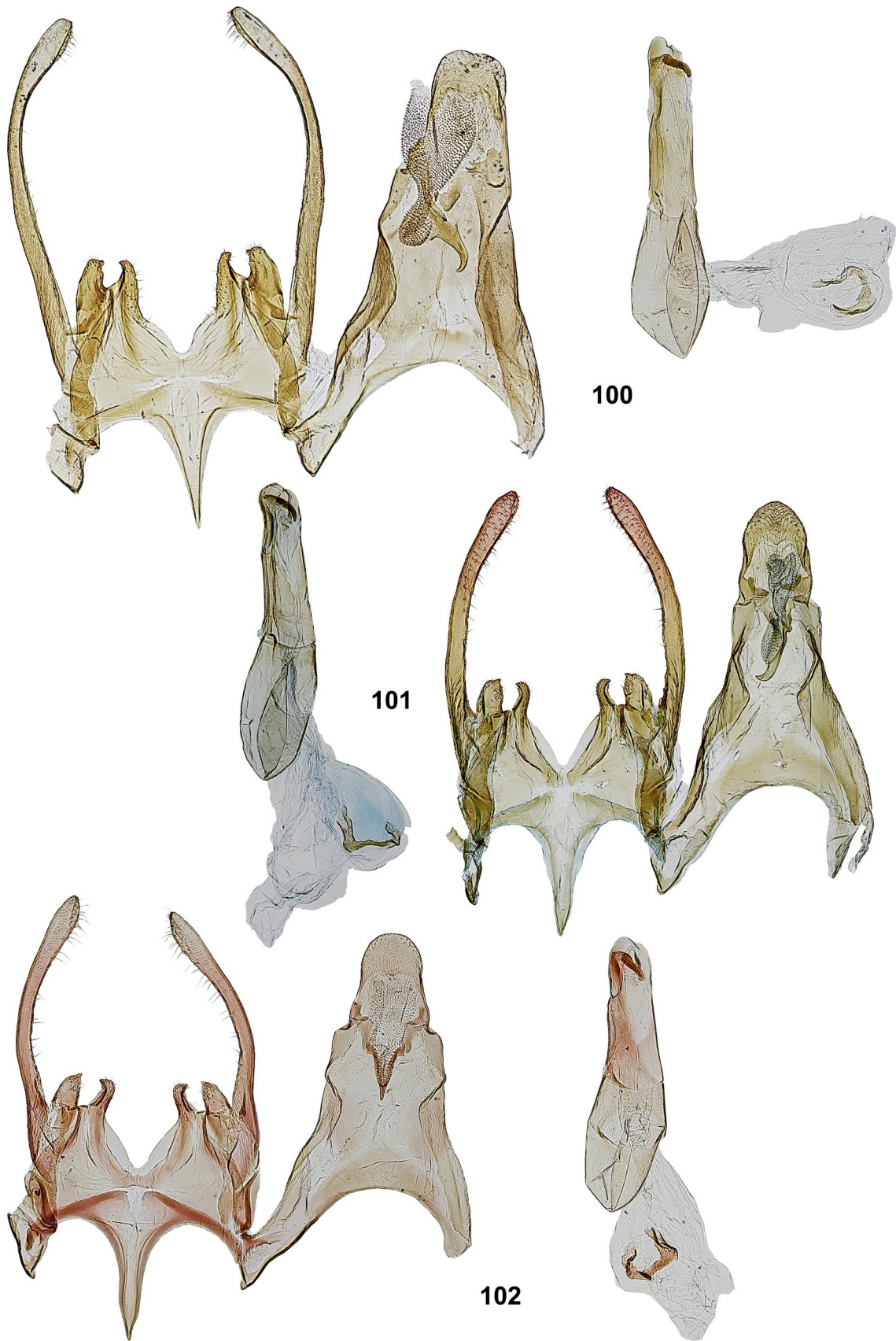


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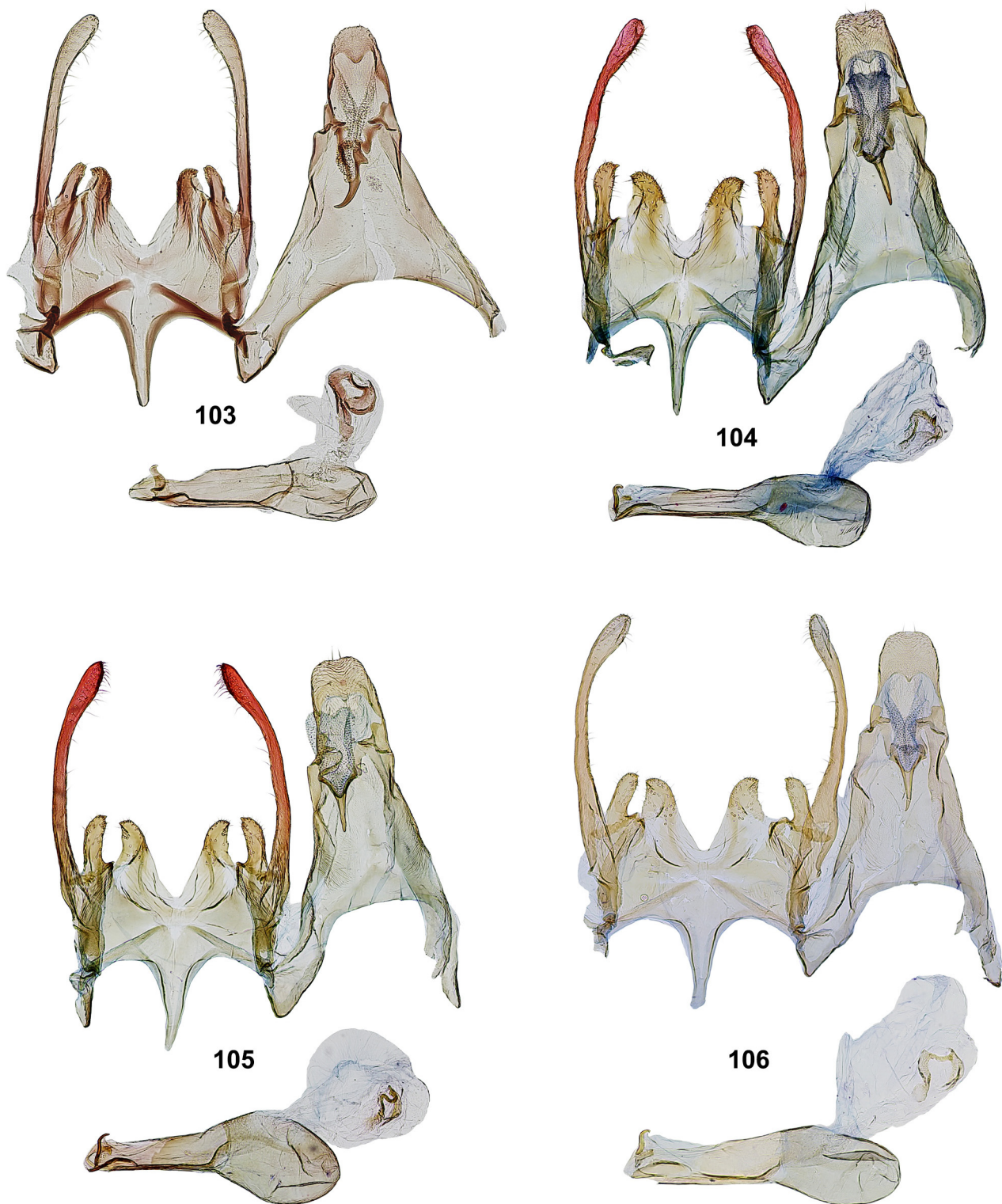


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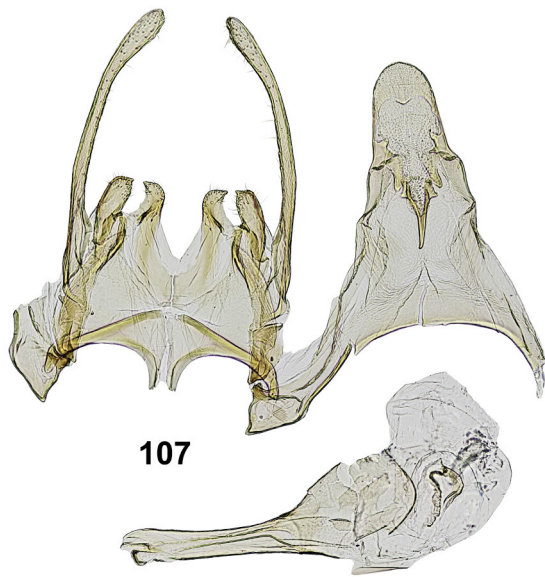
Figures 96–99. *Scrobipalpa* spp., male genitalia. 96, 97. *S. inexplectata* sp. nov., PT, Altai. 96. Gen. slide 439/16, OB. 97. Gen. slide 440/16, OB. 98. *S. cinerosella*, Altai (gen. slide 298/21, OB). 99. *S. kullbergi* sp. nov., HT, Tuva (gen. slide 311/16, OB).



Figures 100–102. *Scrobipalpa* spp., male genitalia. 100. *S. inferna*, Buryatia (gen. slide 253/16, OB). 101, 102. *S. altubura* sp. nov. 101. HT, Altai (gen. slide 175/21, OB). 102. PT, Tuva (gen. slide 201/15, OB).



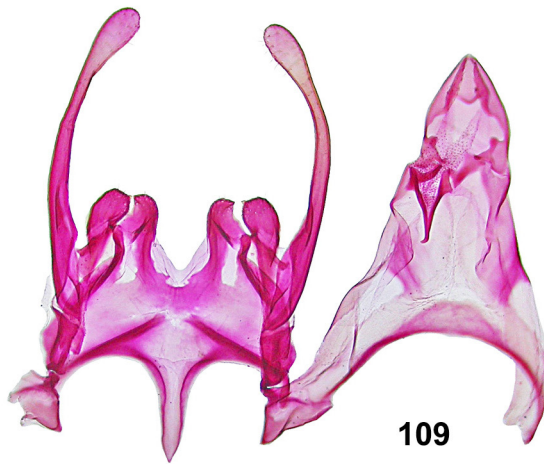
Figures 103–106. *Scrobipalpa* spp., male genitalia. 103. *S. ferruginosa*, Zabaikalskiy krai (gen. slide 202/15, OB). 104, 105. *S. krasnogorka* sp. nov., Altai, PT. 104. Gen. slide 171/21, OB. 105. Gen. slide 169/21, OB. 106. *S. spumata*, Tuva (gen. slide 199/19, OB).



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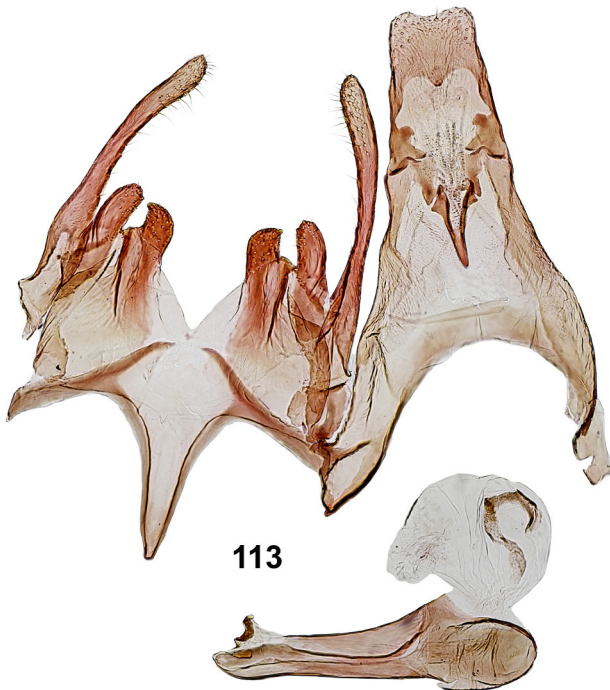
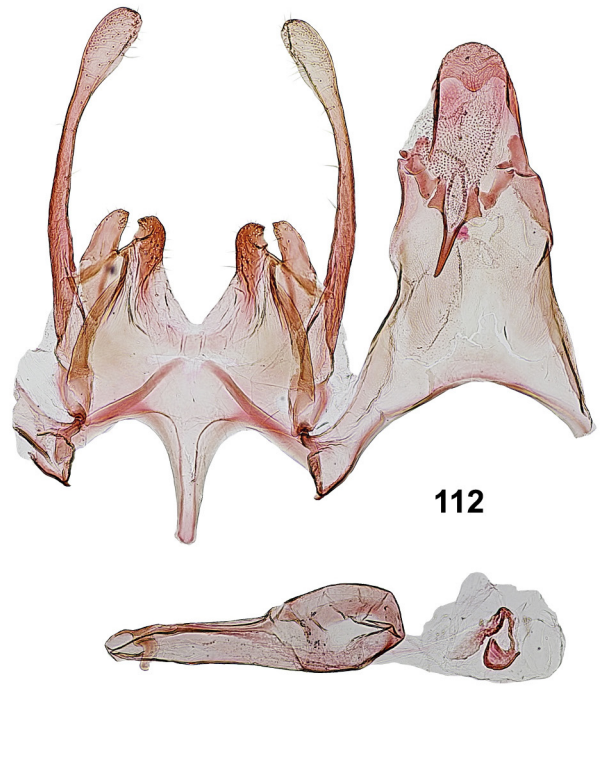
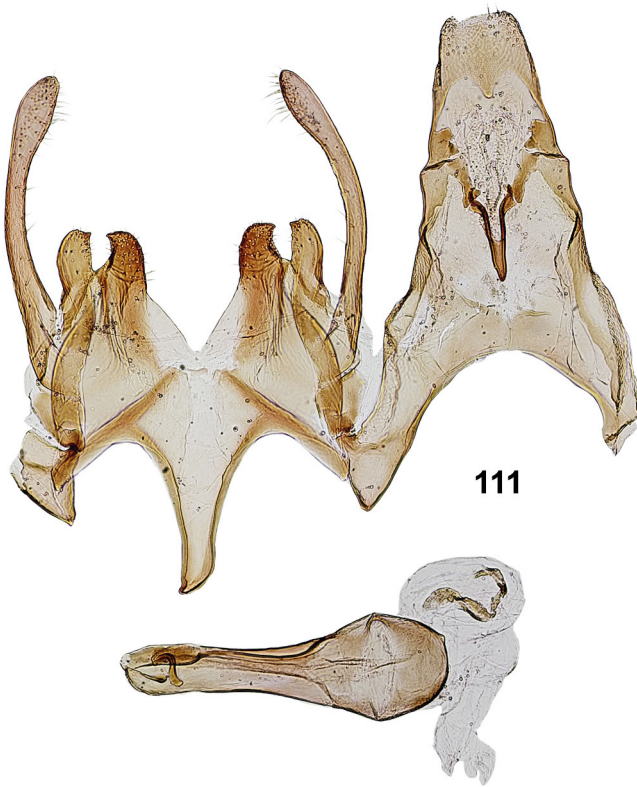


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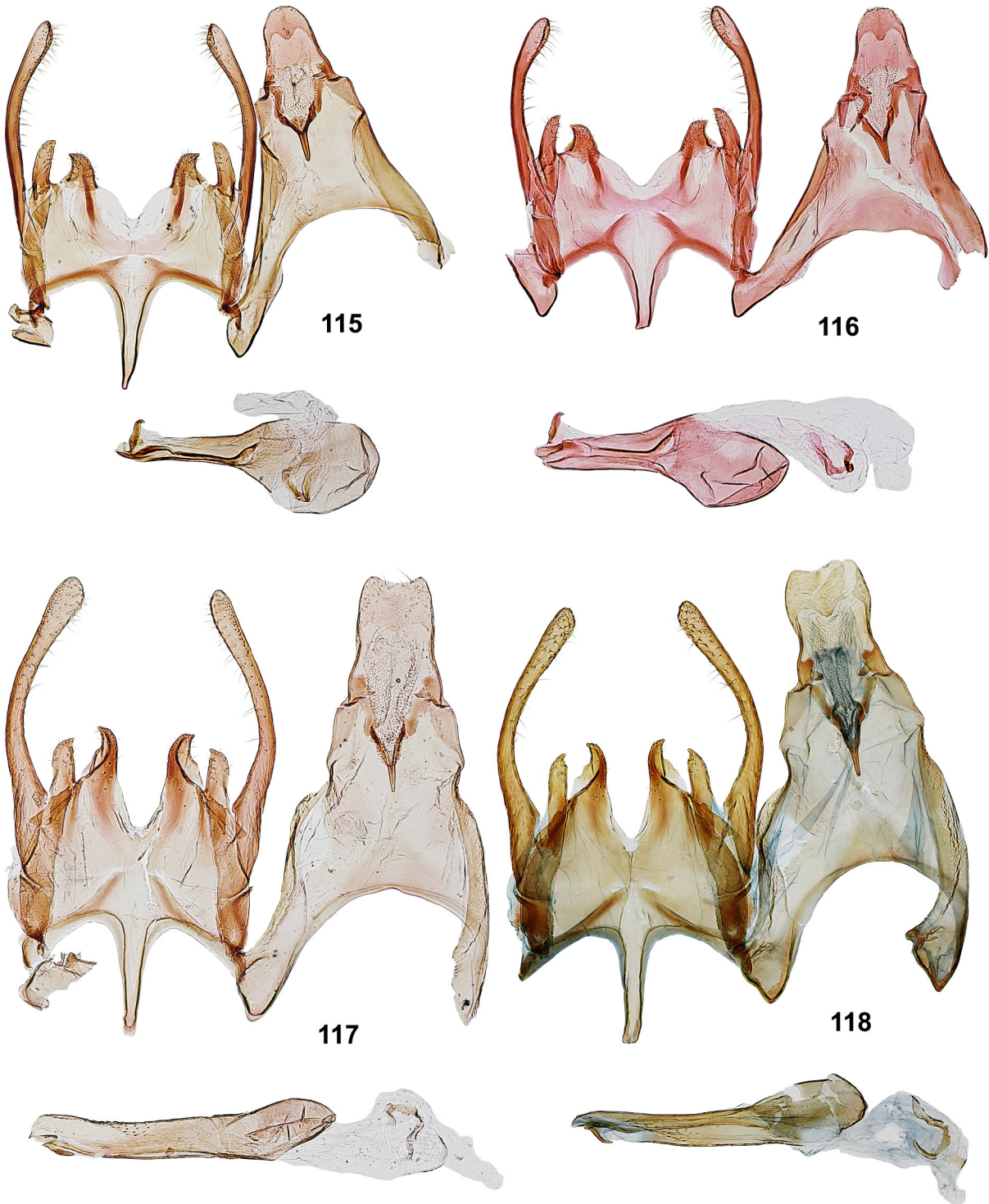


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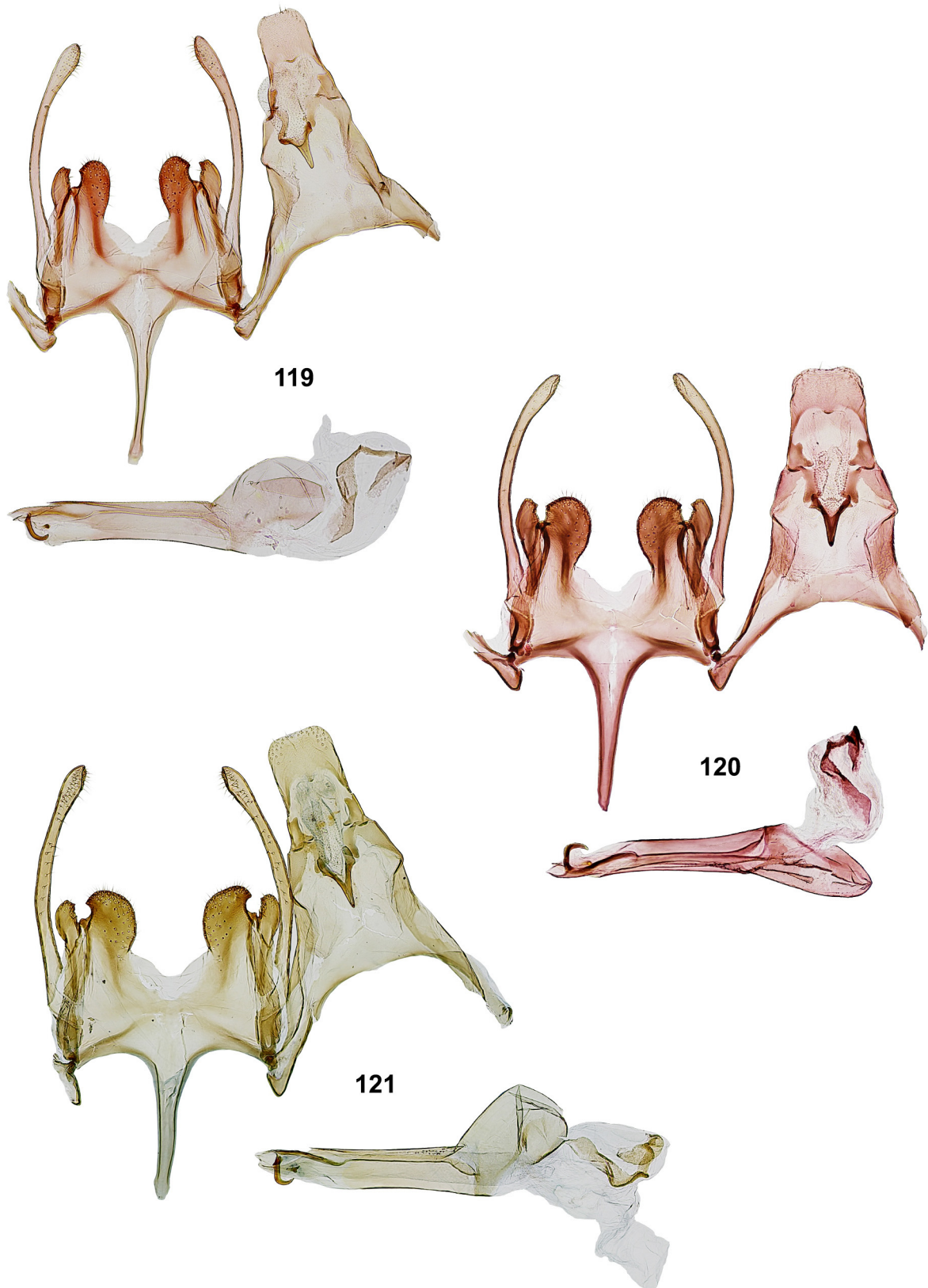
Figures 107–110. *Scrobipalpa similis*, male genitalia. 107, 108. HT, Mongolia 107. Unrolled (gen. slide Gz. 4251, Povolný, remounted by OB). 108. Ventral view (gen. slide Gz. 4251, Povolný). 109. Zabaikalskiy kraj (gen. slide 31/07, OB). 110. Zabaikalskiy kraj (gen. slide 174/18, OB).



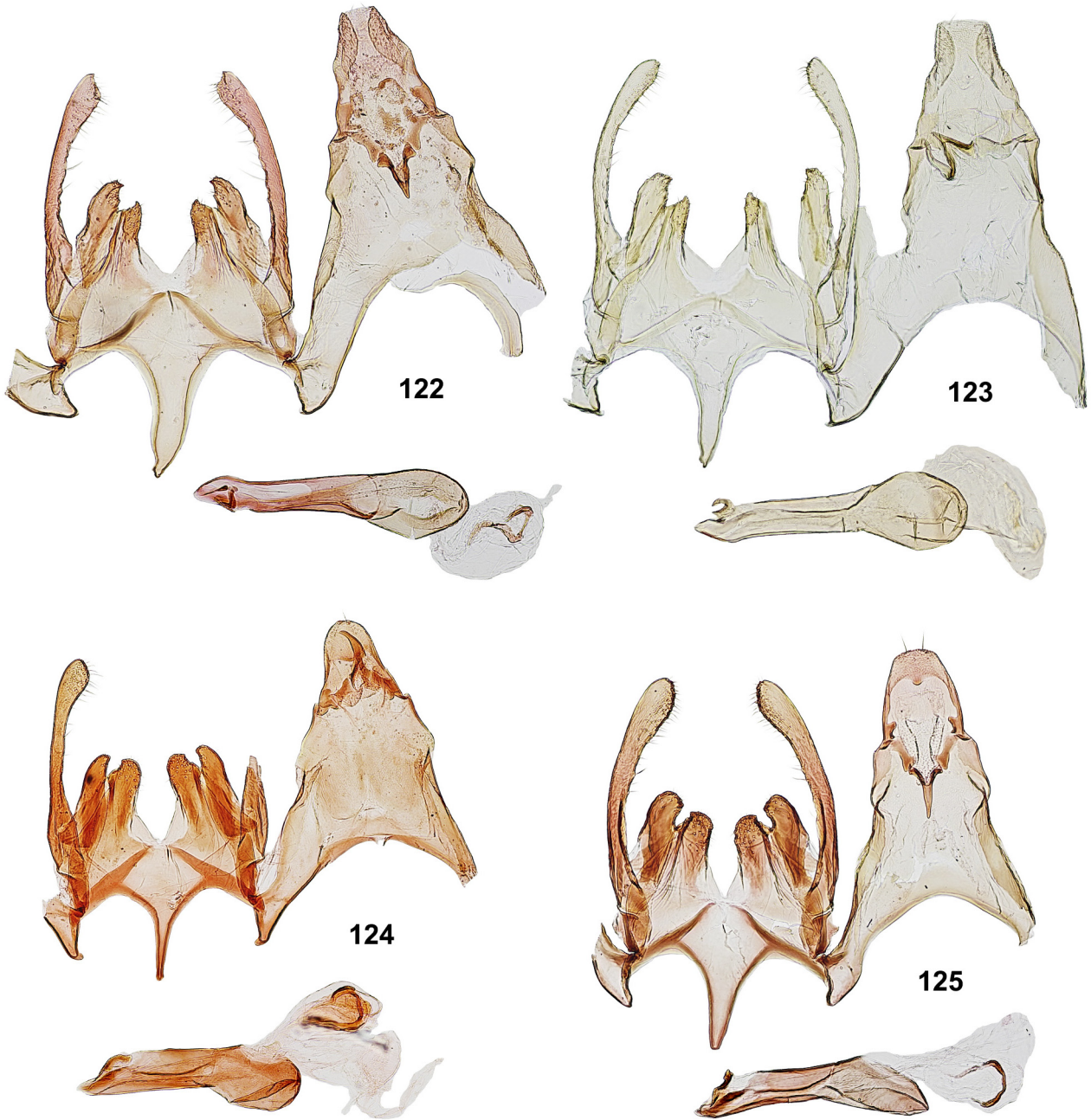
Figures 111–114. *Scrobipalpa mixta*, male genitalia. 111. Altai (gen. slide 195/16, OB). 112. Tuva (gen. slide 332/16, OB). 113. Kazakhstan (gen. slide 86/16, OB). 114. Ukraine (gen. slide 206/16, OB).



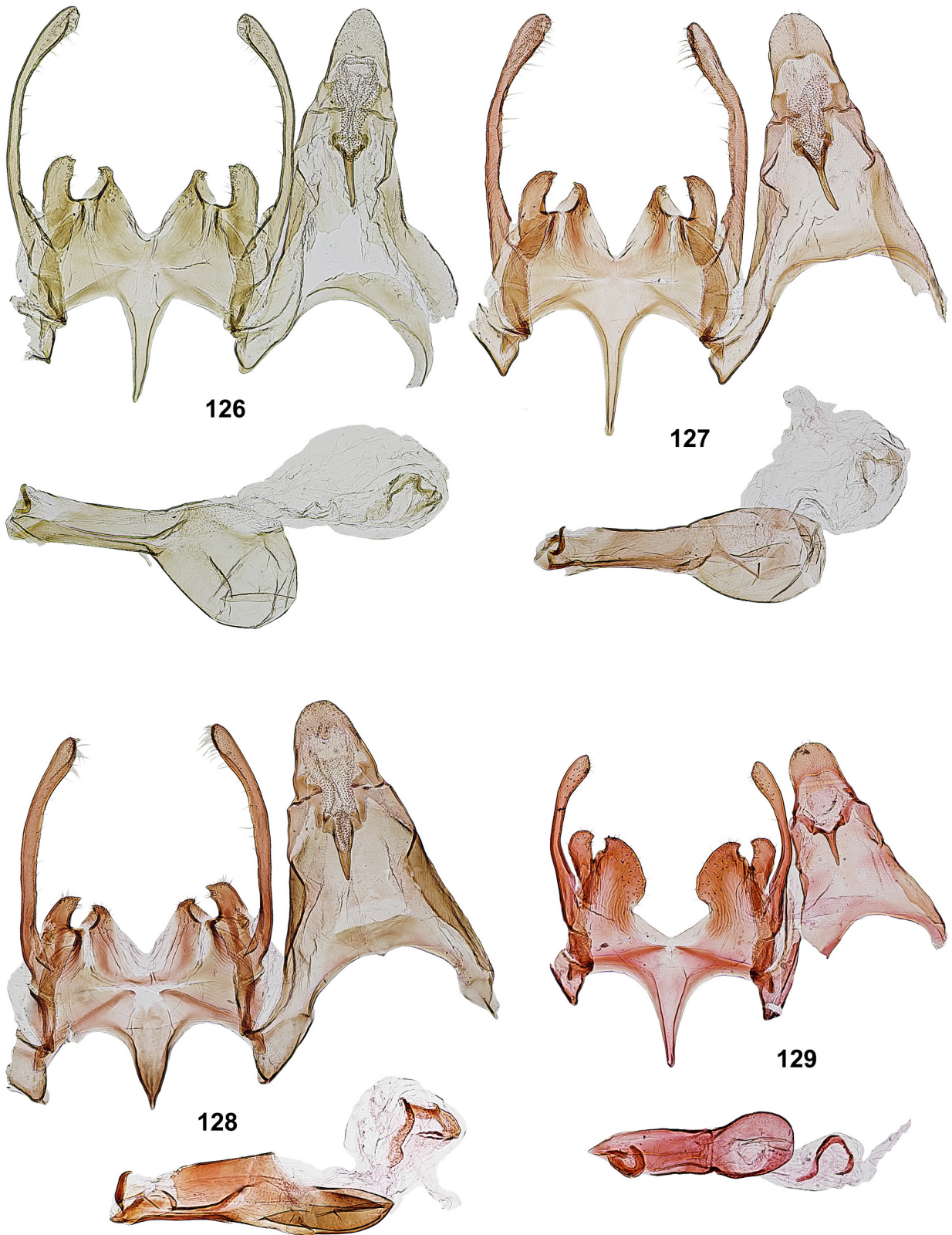
Figures 115–118. *Scrobipalpa* spp., male genitalia. 115, 116. *S. buryatica* sp. nov., Buryatia. 115. HT (gen. slide 378/16, OB). 116. PT (gen. slide 176/16, OB). 117, 118. *S. albiflava* sp. nov. 117. HT, Tuva (gen. slide 203/16, OB). 118. PT, Altai (gen. slide (265/20, OB).



Figures 119–121. *Scrobipalpa* spp., male genitalia. 119. *S. ochrogera*, PT, Kyrgyzstan (gen. slide 169/16, OB). 120, 121. *S. sibirica*, Altai. 120. HT (gen. slide 8/16, OB). 121. Gen. slide 259/20, OB.



Figures 122–125. *Scrobipalpa* spp., male genitalia. 122, 123. *S. rebeli*. 122. Buryatia (gen. slide 221/16, OB). 123. HT of *S. zouhari*, China (gen. slide Zh. 5576, D. Povolný). 124, 125. *S. japonica*. 124. Tuva (gen. slide 154/08, OB). 125. Ukraine (gen. slide 216/16, OB).



Figures 126–129. *Scrobipalpa* spp., male genitalia. 126, 127. *S. ravida* sp. nov. 126. HT, Zabaikalskiy krai (gen. slide Bdz. 21, D. Povolný). 127. PT, Buryatia (gen. slide 307/16, OB). 128. *S. ochronerva* sp. nov., HT, Buryatia (gen. slide 383/16, OB). 129. *S. ochraeata* sp. nov., possible male, Tuva (gen. slide 296/16, OB).

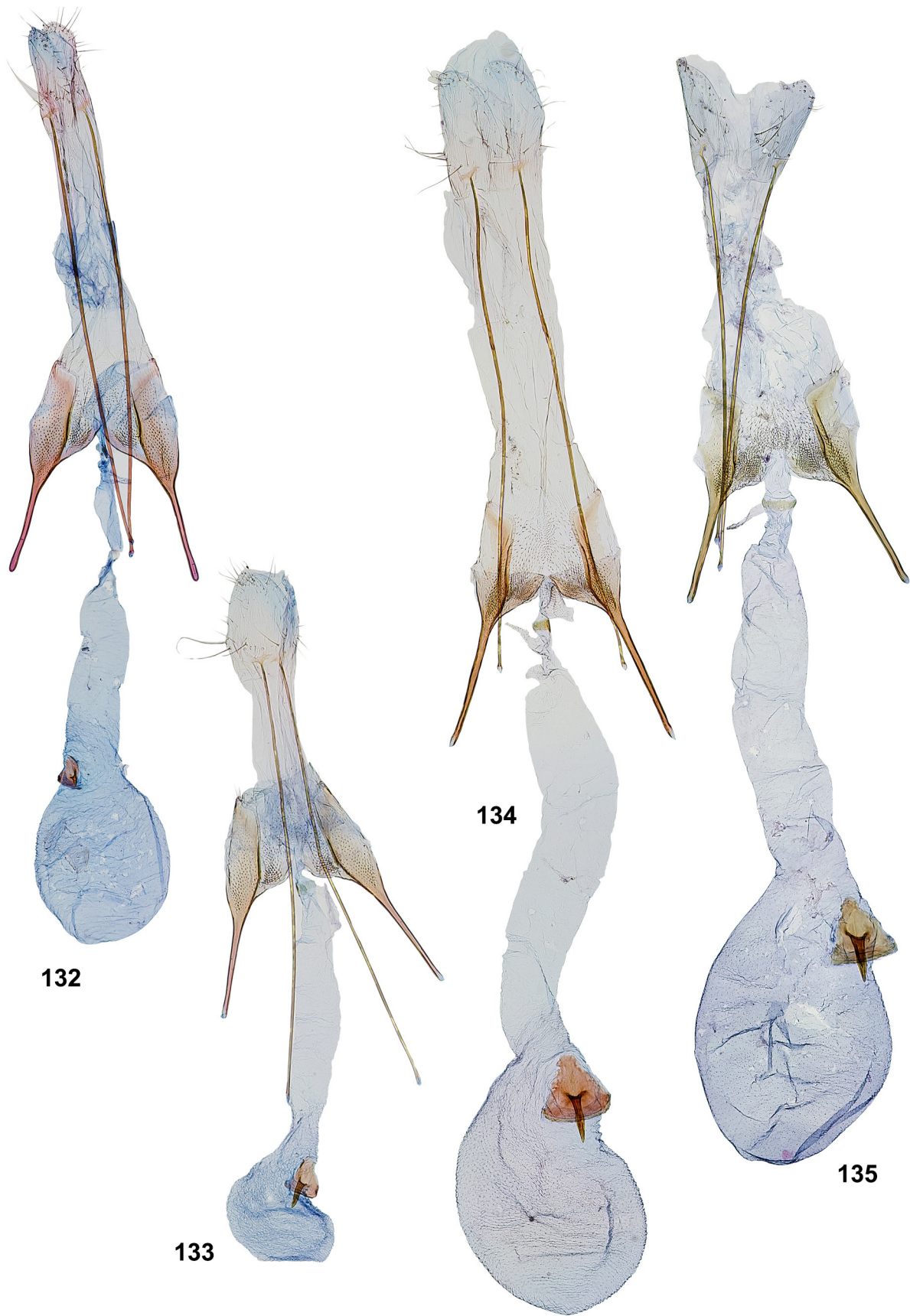


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Figures 130, 131. *Scrobipalpa* spp., female genitalia. 130. *S. intima*, HT, Zabaikalskiy krai (gen. slide Bdz. 35, D. Povolný). 131. *S. punctulata*, Buryatia (gen. slide 404/16, OB).



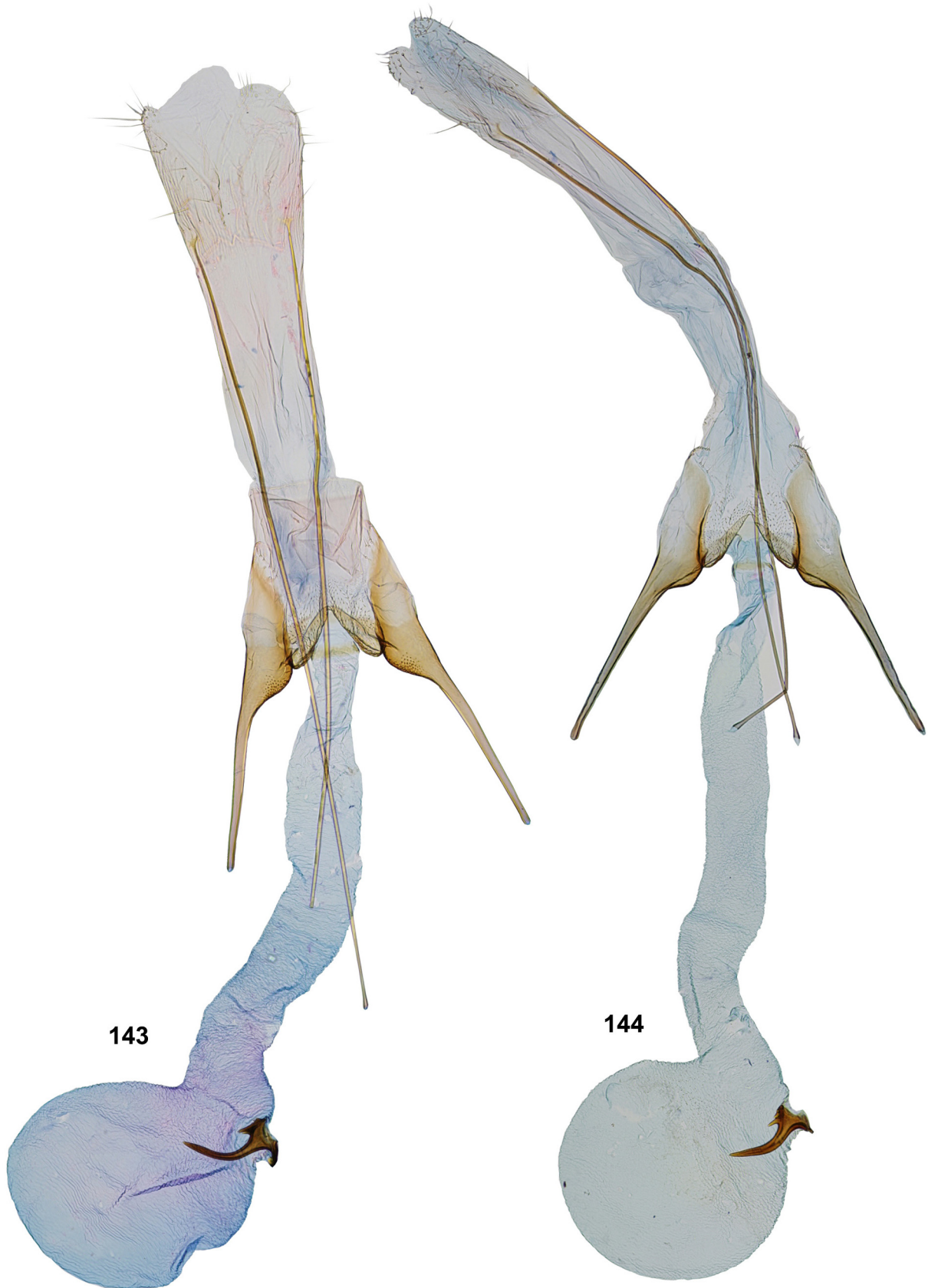
Figures 132–135. *Scrobipalpa* spp., female genitalia. 132, 133. *S. chitensis*, Buryatia. 132. Gen. slide 140/21, OB. 133. Gen. slide 141/21, OB. 134, 135. *S. bidzilyai*, Burytria 134. Gen. slide 143/21, OB. 135. Gen. slide 197/21, OB.



Figures 136–140. *Scrobipalpa* spp., female genitalia. 136. *S. tenebrata*, China (gen. slide 226/16, OB). 137, 138, *S. zaitzevi*. 137. Altai (gen. slide 270/20, OB). 138. Kyrgyzstan (gen. slide 235/19, OB). 139. *S. lobata* sp. nov., PT, Altai (gen. slide 306/16, OB). 140. *S. frugifera*, Mongolia (gen. slide 287/19, OB).



Figures 141, 142. *Scrobipalpa* spp., female genitalia. 141. *S. truncata*, Tuva (gen. slide 312/16, OB). 142. *S. marmorella*, Altai (gen. slide 307/21, OB).



Figures 143, 144. *Scrobipalpa inexplicitata* sp. nov., female genitalia, PT. 143. Altai (gen. slide 299/21, OB). 144. Armenia (gen. slide 60/22, OB).



Figures 145–147. *Scrobipalpa* spp., female genitalia. 145. *S. cinerosella*, Altai (gen. slide 240/20, OB). 146. *S. altubura* sp. nov., PT, Altai (gen. slide 176/21, OB). 147. *S. mongolica*, Altai (gen. slide 170/21, OB).



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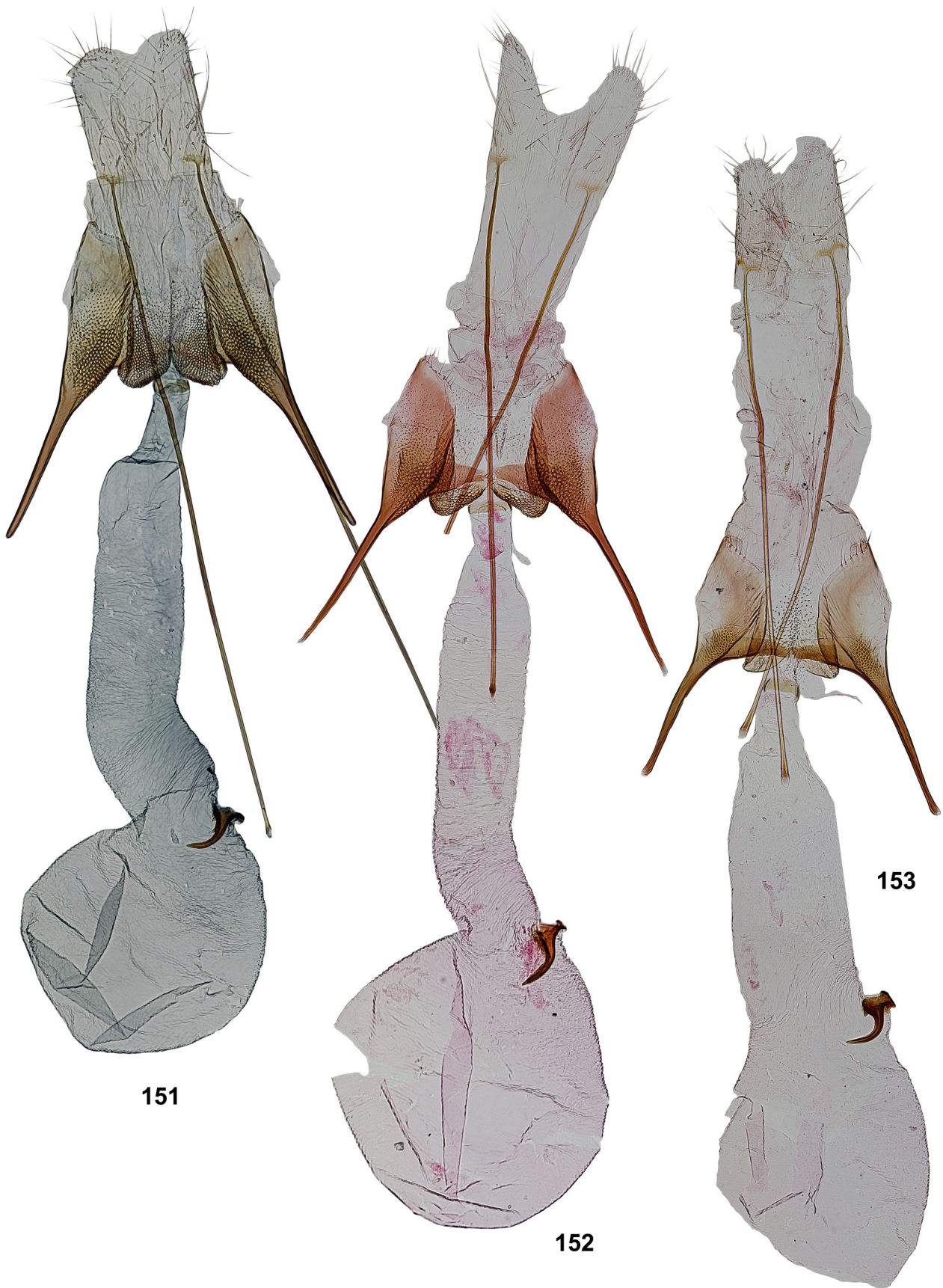


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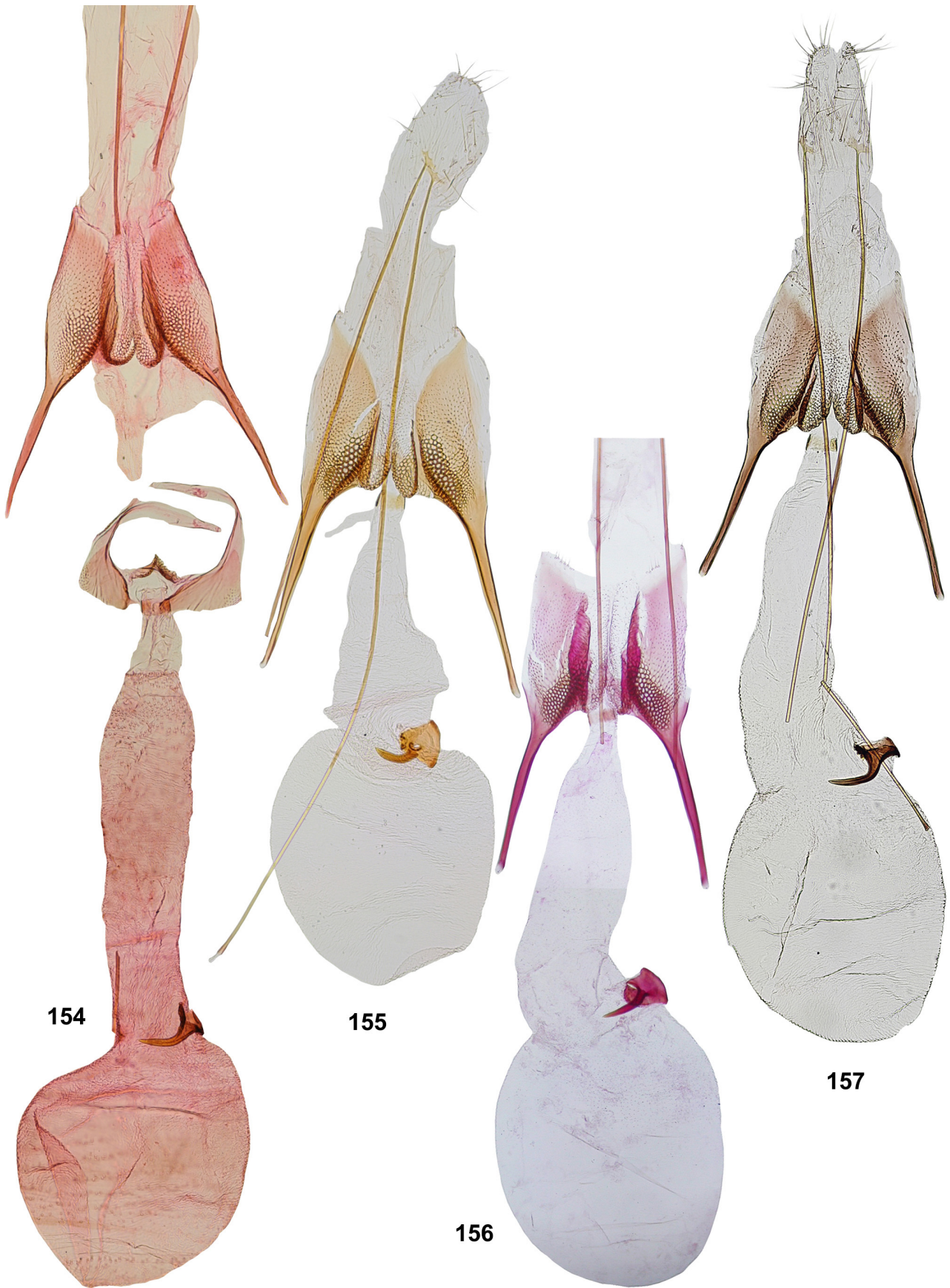


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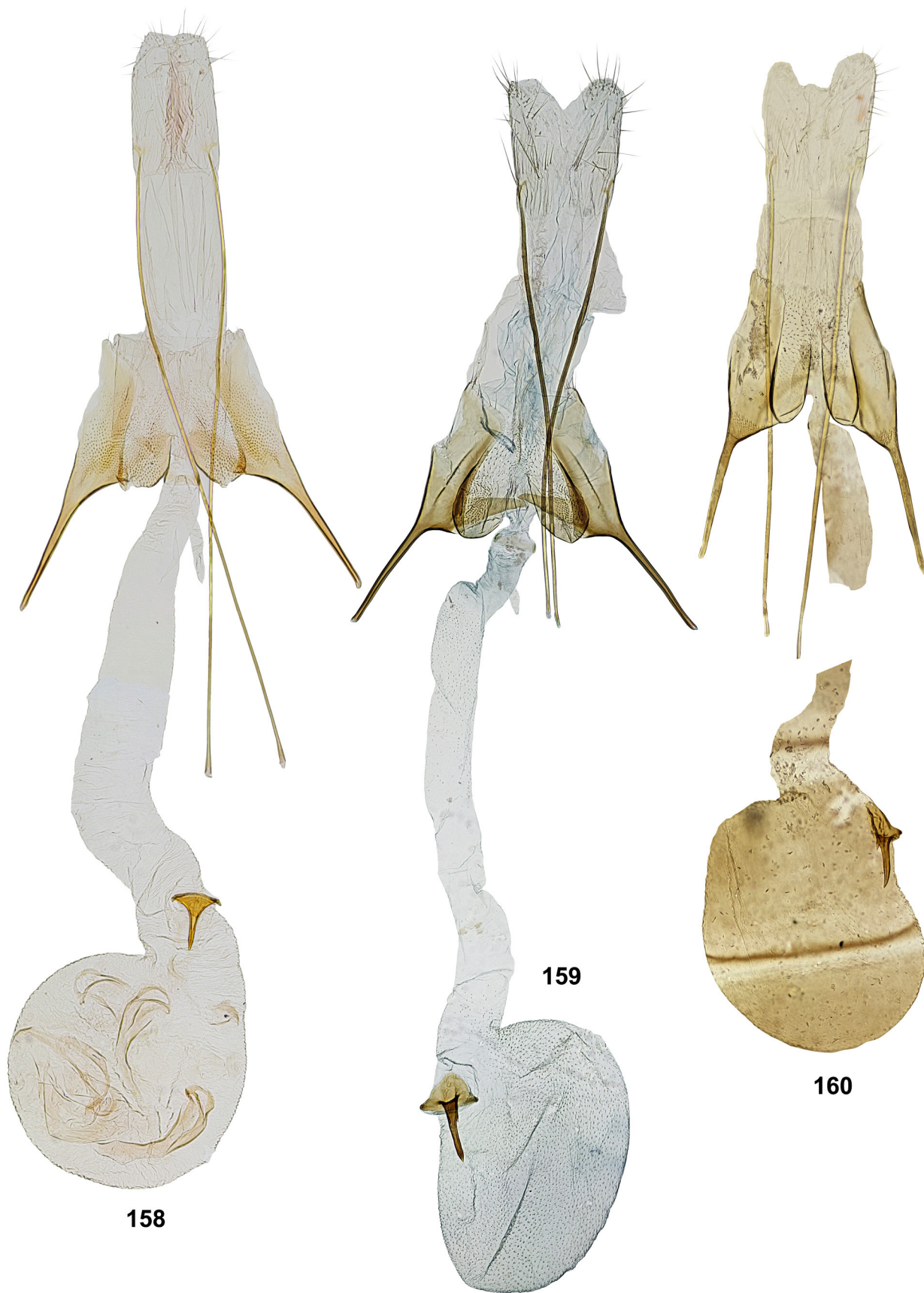
Figures 148–150. *Scrobipalpa ferruginosa*, female genitalia, Zabaikalskiy krai. 148. HT (gen. slide Bdz. 8, D. Povolný). 149. HT of *S. pinosa* (gen. slide Bdz. 50, D. Povolný). 150. Gen. slide 163/08, OB.



Figures 151–153. *Scrobipalpa* spp., female genitalia. 151. *S. krasnogorka* sp. nov., PT, Altai (gen. slide 249/20, OB). 152. *S. spumata*, Tuva (gen. slide 373/16, OB). 153. *S. buryatica* sp. nov., PT, Buryatia (gen. slide 379/16, OB)



Figures 154–157. *Scrobipalpa similis*, female genitalia. 154. HT of *S. kyrana*, Zabaikalskiy krai (gen. slide Bdz. 34, Povolný). 155. Mongolia (gen. slide 245/15, OB). 156. Zabaikalskiy krai (gen. slide 30/07, OB). 157. Zabaikalskiy krai (gen. slide 217/15, OB).



Figures 158–160. *Scrobipalpa* spp., female genitalia. 158. *S. ochrogera*, Kyrgyzstan (gen. slide 33/16, OB). 159. *S. sibirica*, Altai (gen. slide 232/20, OB). 160. *S. occulta*, HT, Turkey (gen. slide Gz. 4340, D. Povolný).



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Figures 161, 162. *Scrobipalpa* spp., female genitalia. 161. *S. rebeli*, Minusinsk (gen. slide 218/16, OB). 162. *S. japonica*, Buryatia (gen. slide 200/16, OB).



Figures 163, 164. *Scrobipalpa ochraeata* sp. nov., female genitalia, Buryatia. 163. HT (gen. slide 325/16, OB). 164. PT (gen. slide 400/16, OB).

Acknowledgements

We express our gratitude to Szolt Bálint (HNHM), Lauri Kaila (MZH), Sergei Sinev (ZIN), Robert Trusch and Michael Falkenberg (SMNK) for their assistance during the study of collection material and for the loan of specimens. Sergei Sinev kindly provided photographs of type specimens deposited in the collection of ZIN. We thank Povilas Ivinskis (State Research Institute Nature Research Centre, Vilnius, Lithuania) for providing material from his collection for study. Robert J. Heckford and Stella Heckford (U.K.) kindly commented on and improved the English language of the manuscript. We got reviews from Houhun Li (Nankai University, Tianjin, China) and Margarita Ponomarenko (Federal Scientific Center of the East Asia Terrestrial Biodiversity, Vladivostok, Russia). Both reviewers checked the manuscript carefully, corrected misprints and provided very helpful comments and suggestions, especially concerning the use of some morphological terms. The work was supported by the Ministry of Culture of the Czech Republic (DKRVO 2019-2023/5.I.d, National Museum, 00023272) (JŠ) and by the State Budget Program “Support for the Development of Priority Areas of Scientific Research” (Code: 6541230) (OB).

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