



New synonyms and redescription of two little-known *Thiodia* species (Lepidoptera, Tortricidae): *T. ursulana* (Kennel, 1919) **comb. nov.** and *T. klapperichi* (Razowski, 1967) **comb. nov.**

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Abstract

The lectotype of *Semasia ursulana* Kennel, 1919 is designated. The name of the species is recombined as *Thiodia ursulana* (Kennel, 1919) **comb. nov.** and considered as a senior synonym of *Thiodia aequilibris* Tsvetkov, 2017 **syn. nov.** The female genitalia of this species are described for the first time. *Eucosma buratana* Blackstein, 2014 **syn. nov.** described from Tajikistan is synonymised with *Thiodia klapperichi* (Razowski, 1967) **comb. nov.** The latter species was known from the male holotype from Afghanistan. We report *T. klapperichi* from Turkmenistan for the first time and describe hitherto unknown female of this species. Adults and male genitalia of the type specimens of *T. ursulana* and *T. klapperichi* are illustrated. *Thiodia glandulosana* Walsingham, 1907 is transferred to *Epinotia* Hübner [1825]: *Epinotia glandulosana* (Walsingham, 1907) **comb. nov.** An annotated checklist of 27 species of *Thiodia* is given. In addition, the holotypes of *Thiodia dahurica* (Falkovitsh, 1965), *Thiodia densistriata* (Falkovitsh, 1964) and *Thiodia hyrcana* Kuznetsov, 1976 are illustrated for the first time

Key words: *Epinotia*, *Eriopsela*, *Eucosma*, lectotype designation, new combination, new records, Palaearctic region, Afrotropical region

Introduction

Afro-Palaearctic genus *Thiodia* Hübner [1825] with type species *Tortrix citrana* Hübner [1799] comprises 27 species, of which 21 are known in the Palaearctic region with ten species in Europe (Hübner [1796–1834]; Frölich 1828; Godart & Duponchel 1834–[1836]; Treitschke 1835; Lederer 1859; Staudinger 1871; Christoph 1888; Rebel 1903; Walsingham 1908; Kennel 1908–1921; Meyrick 1912, 1913; Caradja 1928; Falkovitsh 1964, 1965; Obratsov 1964, 1965; Kuznetsov 1972, 1976; Budashkin 1990; Aarvik 2004; Razowski & Trematerra 2008, Razowski 2015; Gilligan *et al.* 2018; Razowski *et al.* 2019; Lepiforum 2022; Tsvetkov 2022). The genus is very diverse habitually: wings vary from very broad to narrow, pattern is also variable from more or less uniformly greyish or reddish-brown to dark with distinct white, silver or reddish striation; some species have several (usually two) straight or broken transverse fasciae on light ground colour, sometimes in combination with distinct oblique broadly dashed longitudinal spots; there are brown species with narrow oblique line from about ½ of costa to tornus, and pale light brown species with dark undulated pattern along dorsal margin, and others (Figs 1, 6, 14–16). Male forewings of

most of the species bear a pheromone (scent) organ as a small fossa filled with androconial scales between Cu stalk and A2+3 (Obraztsov 1964: fig. 132). This organ is absent in *Thiodia couleruana* (Duponchel, 1834) and it is not confirmed in Afrotropical species of *Thiodia*. In male genitalia, uncus usually short and narrow, rarely two-bladed or reduced; socii small. Valva comparatively long, with harp as a rule, sometimes covered with stout bristles, ventral margin with excavation of various shape and size, and with process on top of sacculus or base of cucullus in some species; neck of valva weakly developed; transverse row of long bristles extending from ventral angle of cucullus to about dorsal angle at base of valva in some species. Aedeagus normally tubular, small or middle in size, sometimes with one small tooth or group of teeth in its pre-apical portion; cornuti vary in length, sometimes gathered in bunch or absent; in some species aedeagus pistol-shaped or bears lateral process. Female genitalia with ovipositor short or middle length. Papillae anales small to medium, weakly sclerotised. Apophyses anteriores and posteriores of middle length, thickened in most of the species. Ostium opening normally located in deep emargination of posterior margin of sternum VII, small, except for unusually large in *T. leucocitron* Tsvetkov, 2022. Sterigma absent or weakly developed being detectable as comparatively narrow sclerotised ring or oval around ostium, with caudal flattened process—postvaginal plate in some species. Antrum small, normally cap-shaped, goblet or funnel-shaped, well sclerotised or membranous; exceptionally large, asymmetrical and strongly edged in *T. leucocitron*. Ductus bursae moderately long and broad, sometimes with long (to half of its length) well sclerotised caudal portion (colliculum). Corpus bursae from small to comparatively large, usually egg-shaped or broadly ovate to pear-shaped, rarely rounded; signa usually small, elongated, funnel-shaped, but sometimes rounded with inner side convex, single or double, absent in some species.

The present paper aims to clarify the status of several taxa of Eucosmini from Central Asia. We transfer two species to *Thiodia*, establish two new synonyms, describe the hitherto unknown females for two species and update the distribution with new records. We also provide an annotated list of *Thiodia* species updated according to the latest taxonomic changes.

Material and methods

The examined material includes type specimens as well as non-type specimens from the institutional or private collections listed below. The data of holotypes are cited exactly as on the labels of the specimens, whereas other material is organised in a standardised format rather than verbatim. The species in the checklist are arranged following the similarity of the male genitalia.

Abbreviations of the collections:

MfN—Museum für Naturkunde Leibniz-Institut für Evolutions- und Biodiversitätsforschung, Germany

HNHM—Hungarian Museum of Natural History, Budapest, Hungary

RCET—Research collection of Eugene Tsvetkov, St Petersburg, Russia

SMNK—Staatliches Museum für Naturkunde Karlsruhe, Germany

ZIN—Zoological Institute, Russian Academy of Sciences, St Petersburg, Russia

Preparations of genitalia slides followed standard techniques (Robinson 1976). Pinned specimens were photographed with a camera Canon 750D in the combination of a Canon MP-E-65 mm lens (Jan Šumpich), Olympus OM-D 5 with Olympus M. Zuiko Digital ED 30 mm F3,5 Macro lens or Canon EOS Rebel T5 equipped with a Canon EFS 60 mm f/2.8 Macro USN lens (Oleksiy Bidzilya), Canon EOS 500D (Hans Blackstein) and a Sony Cyber-shot DSC-HX10V camera (Eugene Tsvetkov). Slide-mounted genitalia were photographed with a Canon EOS 1100D camera mounted on an Olympus BX41 stereomicroscope (Jan Šumpich) or with a Canon EOS 600D digital camera mounted on Olympus U-CTR30-2 head part combined with Carl Zeiss microscope. Sets of 10–20 images were taken for each specimen and assembled into deep-focused images using Helicon Focus 6 and edited in Adobe Photoshop CS5.

We examined four specimens of *T. ursulana* (including two syntypes of *Semasia ursulana* and type series of *Thiodia aequilibris*) and eight specimens of *T. klapperichi* (including the holotype of *Eriopsela klapperichi* and holotype of *Eucosma buratana*) from the collections. 25 additional specimens of *T. ursulana* were collected by

Eugene Tsvetkov by attracting to light of energy saving fluorescent lamp (85 W, 6400 K) in Astrakhan Province of Russia. Genitalia of these specimens were prepared by cleaning the abdomen after maceration in water for 1–2 days, and then were preserved in open containers with sugar syrup (under pinned specimens). The genitalia drawings were made on the base of the photographs.

Results

Thiodia ursulana (Kennel, 1919), **comb. nov.**

Figs 1–5

Semasia ursulana Kennel, 1919: 85.

Eucosma (*Phaneta*) *ursulana* (Kennel, 1919)—Obraztsov 1968: 12.

Eucosma ursulana (Kennel, 1919)—Razowski 1999: 475, 2003: 93.

ursulana [no genus, Eucosmini unplaced]—Gilligan & Wright 2013: 331.

= *Thiodia aequilibris* Tsvetkov, 2017: 3, **syn. nov.**

Type material. Lectotype of *Semasia ursulana*, ♂, here designated, labelled: “ursulana Kenn. Type”, “Uralsk”, “Lectotypus *Semasia ursulana* Kennel, 1919, des. O.V. Bidzilya, H. Blackstein, Yu.I. Budashkin, J. Šumpich, E.V. Tsvetkov, 2022” (MfN). Paralectotype, ♂, here designated, labelled: “ursulana n. sp. Kenn. Type. 89.90.”, “Uralsk”, “Paralectotypus *Semasia ursulana* Kennel, 1919, des. O.V. Bidzilya, H. Blackstein, Yu.I. Budashkin, J. Šumpich, E.V. Tsvetkov, 2022 (MfN).

Additional material examined. ♂, Indersk, 28.v, ex coll Kröne, gen. slide 18/028, JŠ (HNHM). 1 ♂, [without locality data], “*Semasia ursulana* Kenn., N. Filipjev det”, “A. Bang-Haas” (ZIN). 1 ♂, 1 ♀, Russia, Astrakhan Prov., 23 km NE of vill. Khosheutovo, N 47°10'48”, E 48°01'50”, 16.v.2018 (Tsvetkov) (RCET); 17 ♂, 6 ♀, Russia, Astrakhan Prov., 18 km of vill. Dosang, N 47°00'28”, E 48°06'26”, 12.v.2018 (Tsvetkov) (RCET).

The species was originally described in the genus *Semasia* Stephens, 1829. Later, Obraztsov (1968: 12) transferred it to the subgenus *Phaneta* Stephens, 1852 of the genus *Eucosma* Hübner, 1823 based on external morphology of adults. Razowski (1999: 475; 2003: 93) followed Obraztsov (1968), but listed *ursulana* under „unplaced species“ of *Eucosma*. He also stated that the species was known only from the original description and that neither the type nor conspecific specimens were found. Gilligan & Wright (2013: 331) placed *ursulana* in the group of species with unclear generic assignment (“Eucosmini unplaced”), and noticed that the holotype was deposited in MfN (as MNHU).

Semasia ursulana Kennel, 1919 was described from two males collected in the environs of Uralsk (W Kazakhstan) (Kennel 1919: 85, Pl. III, fig. 17). These syntypes, both without abdomens, are kept in the collection of MfN. One of syntypes is in good condition, other with both left fore- and hindwings broken at base. We here designate the better preserved specimen as lectotype (see above under “Type material” and Fig. 1), and the other (with wings broken) as paralectotype. Another male from Western Kazakhstan (Indersk) labelled as “*ursulana*” was found by the authors in the collection of HNHM. The specimen (Fig. 2) agrees externally in all details with two type specimens of *S. ursulana*, so that we have no doubt of their conspecificity.

Thiodia aequilibris was described from the male holotype collected in Atyrau Province and a male paratype from Mangistau Province of W Kazakhstan. The original description is accompanied by the photographs of adults and drawings of the male genitalia (Tsvetkov 2017: 3–4, Pl. 1), which fully agree with *S. ursulana*. Hence, the following synonymy is proposed *Thiodia aequilibris* Tsvetkov, 2017, **syn. nov.** of *Thiodia ursulana* (Kennel, 1919), **comb. nov.**

Remarks. The assignment of *ursulana* to the genus *Thiodia* and the position of the species within the genus was discussed by Tsvetkov (2017: 4, as *T. aequilibris*). The species can be clearly separated from its congeners both by the male genitalia (Fig. 4) and by the wing pattern. The female of *T. ursulana* was illustrated in the original description of *T. aequilibris* (Tsvetkov 2017: 4, Pl. 1, fig. 2). However, the specimen was later lost, but its genitalia have been described, though not illustrated. Below we provide a drawing and re-description of the female genitalia of *T. ursulana* based on additional material from Astrakhan Province of Russia.

Female genitalia (Fig. 5). Papillae anales elongate, covered by small bristles. Posterior apophyses nearly equal to anterior apophyses, strongly broadened in posterior 1/2. Lamella postvaginalis short and small, anterior margin



FIGURES 1–5. *Thiodia ursulana* (Kennel, 1919). 1. Lectotype. Uralsk. 2. Male, Indersk (gen. slide 18/028, JŠ). 3. Female, Russia, Astrakhan Prov., 18 km of vill. Dosang, N 47°00'28", E 48°06'26", 12.V.2018. 4. Male genitalia, Indersk (gen. slide 18/028, JŠ). 5. Female genitalia, Russia, Astrakhan Prov.

with a tiny, sharp central protrusion, posterior margin straight. Lamella antevaginalis small, evenly bent or V-shaped. Antrum small, heart-shaped. Sternum VII trapezoidal with bent sides and rounded angles, two vane-like protrusions of posterior margin vary in length. Ductus bursae membranous, cingulum tapering posteriorly, weakly sclerotised or membranous ventrally, usually obliquely cut anteriorly, covered by sternum VII (in ventral view). Corpus bursa spherical, membranous, with a small horn-like signa.

Distribution. Kazakhstan: Western Kazakhstan, Atyrau and Mangystau Provinces; Russia: Astrakhan Province (new record), Buryatia: Munku-Sardyk Mountain (Filipjev 1929: 6).

Thiodia klapperichi (Razowski, 1967) **comb. nov.**

Figs 6–13

Eriopsela klapperichi Razowski, 1967: 95.

= *Eucosma buratana* Blackstein, 2014: 66, **syn. nov.**

Type material. Holotype of *Eriopsela klapperichi*, ♂, labelled: “J. Klapperich, Pagmangebirge, 3000 m, 28.8.53, O. Afghanistan” | “Holotype” | “G.S.-5663♂, *Eriopsela klapperichi* Raz., det. J. Razowski” | Prep. Nr. 4882♂” (SMNK). Holotype of *Eucosma buratana*, ♂, labelled: “7.х.1953 г, Таджикистан у подножья г. Буратау, на свет, Ю. Щеткин” [7.x.1953, Tajikistan, near the foot of Buratau mt., on light, Yu. Shchetkin”] (MfN).

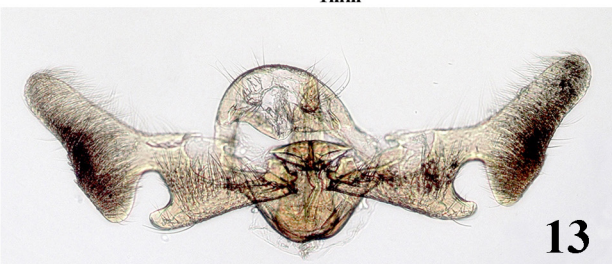
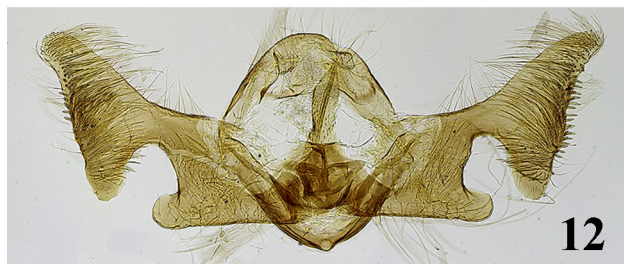
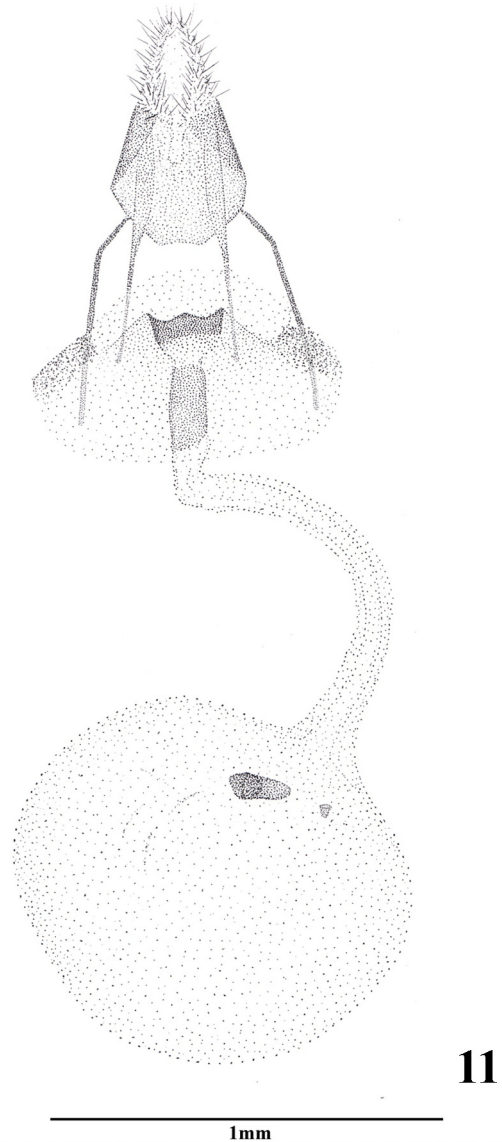
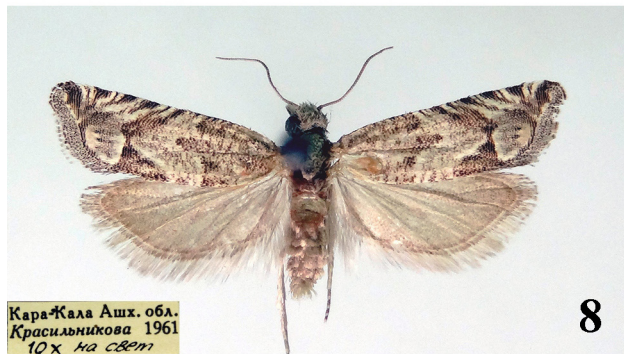
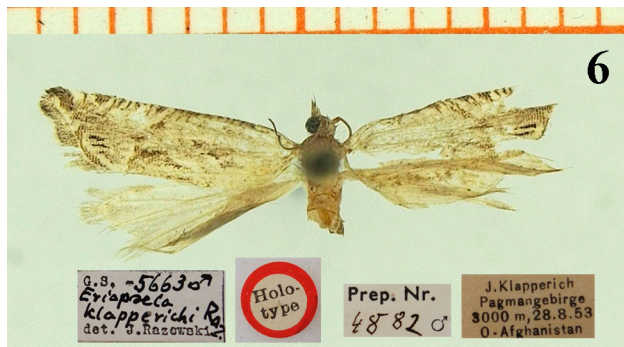
Additional material examined. ♂, [Turkmenistan] Kara-Kala, Ashhabad Province, 28.ix.1961, on light (Krasilnikova); ♂, same data as for preceding but 29.ix.1961; ♀, same data as for preceding but 5.x.1961; ♂, Phiryuza env., Ashhabad Province, [no data].ix.[no year], on light (Krasilnikova); ♂, Badkhyz, Kyzyltdzhar, 3.x.1980 (Pechen’); ♂, Tajikistan, near the foot of Buratau mt., on light, 7.x.1953 (Shchetkin) (all ZIN).

Eriopsela klapperichi Razowski, 1967 was described from the male holotype from Pagman Mountains in Afghanistan. The specimen is in rather poor condition (Fig. 6), however the genitalia are characteristic by having a deep sub-ovate emargination on the ventral margin of the valva (Fig. 12). *Eucosma buratana* was described from two males collected near the foot of Buratau Mountain in Tadjikistan. The photographs of wings and the male genitalia in the original description (Blackstein 2014, figs 2, 3) fully agree with the holotype of *E. klapperichi*. Our study of additional material (five males and one female from Turkmenistan and one male from the type locality of *E. buratana* in Tajikistan) showed the presence of small rounded bloating on the base of the male forewing (Fig. 10). This character is an autapomorphy of the genus *Thiodia* (Kuznetsov 2001: 440). Taking into consideration that the genitalia of both sexes also agree in general with *Thiodia* (see remarks in Discussion), we transfer the species to this genus and we propose the new synonymy: *Eucosma buratana* Blackstein, 2014, **syn. nov.** of *Thiodia klapperichi* (Razowski, 1967) **comb. nov.**

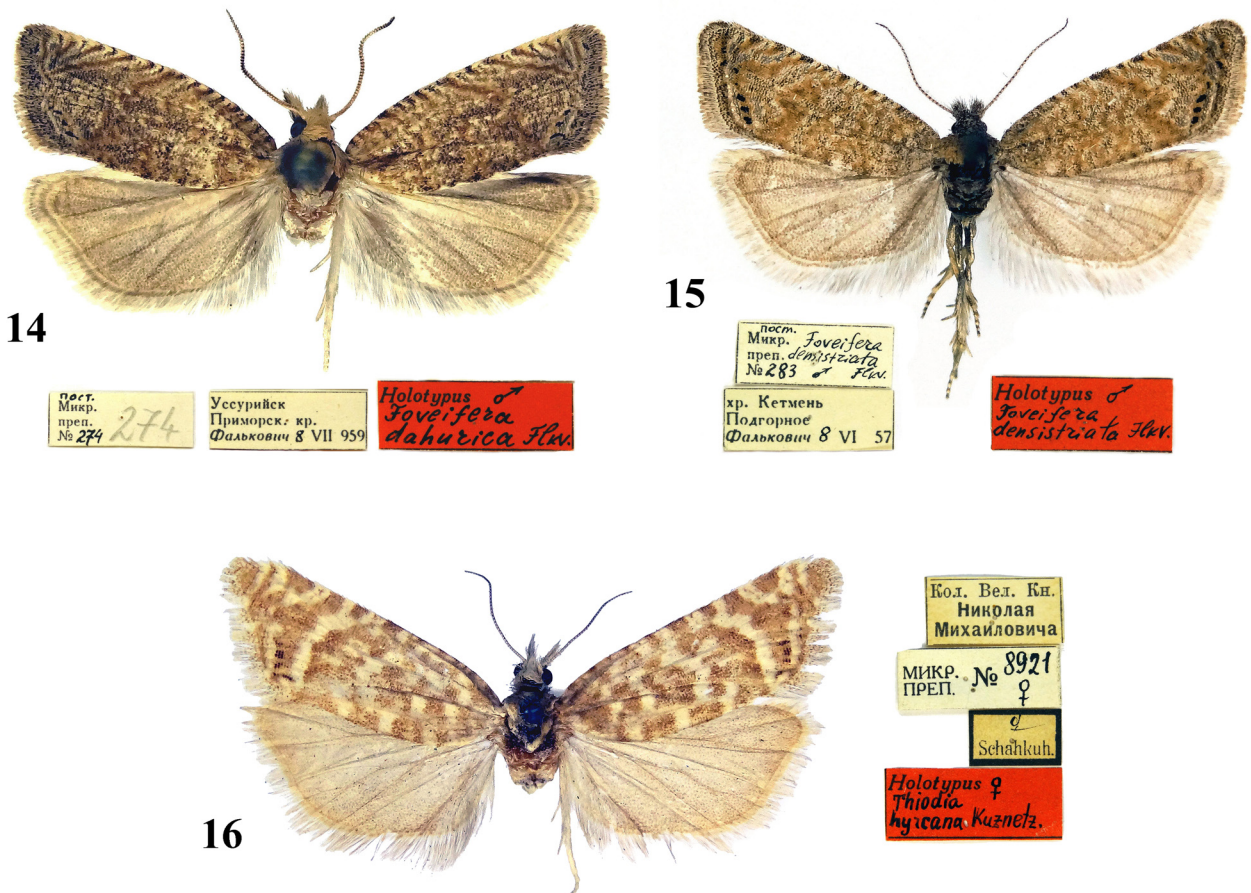
Below we provide a description of the female genitalia of *T. klapperichi* based on a specimen from Turkmenistan (Fig. 9).

Female genitalia (Fig. 11). Papillae anales elongate, membranous, relatively small, covered by fine bristles. Posterior apophyses longer than anterior apophyses, strongly broadened in posterior 1/2, narrowing in middle, very thin in anterior 1/2. Anterior apophyses well sclerotised, slightly bent at their bases. Antrum cup-shaped. Ductus bursae membranous, cingulum long, distinctly sclerotised; long anterior portion of ductus rolled (shown ventrolaterally on fig. 11, so as bursa copulatrix), entirely enclosing the corpus bursae in its original state. Sternum VII broad and short, anterior margin straight, widely rounded on the sides; vane-like, sclerotised areas located posteriorly on the sides, covered by modified bristles (very small, oval). Corpus bursa spherical, membranous, with two horn-like signa located posteriorly opposite to each other; one of these signa very small and hardly noticeable.

Distribution. Afghanistan, Tajikistan, Turkmenistan (new record).



FIGURES 6–13. *Thiodia klapperichi* (Razowski, 1967). 6–10. Adults. 6. Holotype of *E. klapperichi*. 7. Holotype of *E. buratana*. 8. Male, Turkmenistan. 9. Female, Turkmenistan. 10. Fragment of forewing with bulging (indicated by arrow). 11. Female genitalia. 12, 13. Male genitalia. 12. Holotype of *E. klapperichi*. 13. Holotype of *E. buratana*.



FIGURES 14–16. Holotypes of little-known species of the genus *Thiodia* (all coll. ZIN). 14. *T. daturica* (Falkovitsh, 1965). 15. *T. densistriata* (Falkovitsh, 1964). 16. *T. hyrcana* Kuznetsov, 1976.

An annotated checklist of the genus *Thiodia*

Thiodia Hübner, [1825] 1816: 391. Type species: “*Tortrix citrana* Hübner, [1796-1799]”.

= *Botropteryx* Caradja, 1916: 63. Type species: “*Grapholitha sulphurana* Christoph, 1888”. *Foveifera* Obraztsov, 1946: 28, 40.

Type species: “*Tortrix hastana* Hübner, [1796-1799]. Synonymised by Kuznetsov 1978: 561

= *Gypsonomoides* Obraztsov, 1946: 28, 35. Type species: “*Paedisca delitana* Fischer von Röslerstamm, 1839. [Subgenus: Kuznetsov 1978: 561]

Thiodia couleruana (Duponchel, [1835])

Paedisca couleruana Duponchel [1835] in Godart & Duponchel 1834–[1836]: 353–354, pl. 253, fig. 8. TL: France.

Distribution. Spain, France, Switzerland, Italy, Crimea, Turkey, Iran (Razowski 1999, 2003; Kemal & Koçak 2016; Lepiforum 2022).

Thiodia trochillana (Frölich, 1828)

Tortrix trochillana Frölich 1828: 55. TL: Germany, Württemberg.

= *Paedisca delitana* Fischer von Röslerstamm 1839: 185, pl. 65, fig. 2. TL: ?

= *Paedisca rieseana* Herrich-Schäffer 1851: 240. TL: Germany.

= *Epiblema bracteana* Chrétien 1922: 349. TL: Morocco.

Distribution. North Africa, Central and Southern Europe, Crimea, Eastern Caucasus, Transcaucasia, Turkey, Iran, Turkmenistan (Razowski 1999, 2003; Sinev *et al.* 2019).

***Thiodia ursulana* (Kennel, 1919), comb. nov.** (Figs 1–5)

Semasia ursulana Kennel, 1919: 85, Pl. 3, fig. 17. TL: West Kazakhstan: Uralsk.

= *Thiodia aequilibris* Tsvetkov 2017: 3–5, pl. I, figs 1, 2, 3, 4. TL: West Kazakhstan: Atyrau Province, Mangistau Province, **syn. nov.**

Distribution. Russia (Asrtakhan region (new record), Buryatia), West Kazakhstan (Filipjev 1929; Tsvetkov 2017).

***Thiodia klapperichi* (Razowski, 1967), comb. nov.** (Figs 6–13)

Eriopsela klapperichi Razowski 1967: 95–96, fig. 9. TL: Afghanistan, Pagman Mountains.

= *Eucosma buratana* Blackstein, 2014: 66–67, abb. 1, 2, 3, 4. TL: Tajikistan, near foot of Buratau Mt., **syn. nov.**

Distribution. Turkmenistan (new record), Tajikistan, Afghanistan (Razowski 1967; Blackstein 2014).

***Thiodia actuosa* (Meyrick, 1913)**

Eucosma actuosa Meyrick 1913: 274. TL: South Africa, Mpumalanga: Barberton.

Distribution. The Republic of South Africa, Democratic Republic of Congo (Meyrick 1913; Ghesquière 1940).

Note. *Thiodia actuosa* and two following species are characterised by very long and narrow sacculus projections in the male genitalia that is unique for *Thiodia*. Revisionary studies are necessary to confirm if these three species constitute separate group within *Thiodia* or deserve separate genus.

***Thiodia excavana* Aarvik, 2004**

Thiodia excavana Aarvik 2004: 192, figs 13–17, 24, pl. 7, fig. 4. TL: Namibia, Brandberg: Mason Shelter.

Distribution. Namibia (Aarvik 2004).

***Thiodia gracilia* Razowski, 2015**

Thiodia gracilia Razowski 2015: 49–50, figs 32, 69, 116, 117. TL: Namibia, Namibia National Park: Waterberg.

Distribution. Namibia (Razowski 2015).

***Thiodia confusana* Kuznetsov, 1972**

Thiodia confusana Kuznetsov 1972: 314–315. TL: Iran, Elburs Mountains: Keredj.

Distribution. Iran (Kuznetsov 1972).

***Thiodia siccescens* (Meyrick, 1912)**

Eucosma siccescens Meyrick 1912: 57. TL: South Africa, Northern Cape, Bushmanland: Jackals Water.

Distribution. The Republic of South Africa (Meyrick 1912).

***Thiodia citrana* (Hübner, [1799])**

Tortrix citrana Hübner [1799]: pl. 29, fig. 185. TL: Europe.

Thiodia citrana libanicolana Obraztsov, 1964: 21, figs 137, 138, 144, 145. TL: Lebanon. [subspecies].

Distribution. Palaearctic region except for the northernmost areas (Razowski 1999, 2003; Sinev *et al.* 2019).

***Thiodia major* (Rebel, 1903)**

Semasia citrana var. *major* Rebel 1903: 321–322. TL: Bulgaria.

= *Semasia citrana* var. *sardiniana* Schawerda 1936: 79. TL: Sardinia.

Distribution. Southern Europe (Razowski 2003).

***Thiodia nasifera* Razowski & Trematerra, 2008**

Thiodia nasifera Razowski & Trematerra 2008: 38, figs I, 9, III, 7, 8. TL: Mozambique: Zitundo.

Distribution. Mozambique (Razowski & Trematerra 2008).

***Thiodia caradjana* Kennel, 1916**

Thiodia caradjana Kennel 1908–1921: 533, pl. 20, fig. 40. TL: Armenia: Yerevan.

Distribution. Armenia, Turkey (Kennel 1916; Kemal & Koçak 2020b).

***Thiodia elbursica* Kuznetsov, 1972**

Thiodia elbursica Kuznetsov 1972: 315–316. TL: Iran, Elburs Mountains: Keredj.
Distribution. Iran (Kuznetsov 1972).

***Thiodia sulphurana* (Christoph, 1888)**

Grapholitha sulphurana Christoph 1888: 311. TL: Russia, Volgograd region: Sarepta.
Distribution. Spain, France, Italy, Ukraine, Russia (South of European part, South of Western Siberia), Transcaucasia, Turkey, Kazakhstan (Razowski 1999, 2003; Sinev *et al.* 2019; Kemal & Koçak 2020b).

***Thiodia leucocitron* Tsvetkov, 2022**

Thiodia leucocitron Tsvetkov, 2022: 298, figs 1–3, 5. TL: South Kazakhstan, Karatau Mts: Ashisai.
Distribution. South Kazakhstan (Karatau Mts) (Tsvetkov 2022).

***Thiodia hyrcana* Kuznetsov, 1976 (Fig. 16)**

Thiodia hyrcana Kuznetsov 1976: 27, fig. 28. TL: Iran: Shahkuh.
Distribution. Iran (Kuznetsov 1976).

***Thiodia anatoliana* Kennel, 1916**

Thiodia anatoliana Kennel 1908–1921: 532, pl. 20, fig. 39. TL: Armenia: Yerevan.
Distribution. Armenia, Turkey, Northern Iran, Lebanon (?) (Kennel 1916; Razowski 1999; Kemal & Koçak 2020b).

***Thiodia placidana* (Staudinger, 1871)**

Grapholitha placidana Staudinger 1871: 281–282. TL: Russia, Volgograd region: Sarepta.
Distribution. Russia (Volga-Don region, Kalmykia), Transcaucasia, Kazakhstan (Razowski 2003; Nedoshivina & Saranova 2005; Sinev *et al.* 2019).

***Thiodia fessana* (Mann, 1873)**

Grapholitha fessana Mann 1873: 573. TL: Turkey, İçel province: Gülek.
= *Thiodia uyghurica* Kemal & Koçak 2020a: 13–14. TL: Turkey, Adiyaman province, Kahta: Nemrut Mt.
Distribution. Georgia, Turkey (Mann 1873; Kemal & Koçak 2020a,b).

***Thiodia africana* Razowski & Trematerra, 2019**

Thiodia africana Razowski & Trematerra, 2019 in Razowski, Collaci & Trematerra 2019: 748, figs 21, 45, 46. TL: Ethiopia: Choke Mts.
Distribution. Ethiopia (Razowski *et al.* 2019).

***Thiodia densistriata* (Falkovitsh, 1964) (Fig. 15)**

Foveifera densistriata Falkovitsh 1964: 276–277, fig. 11. TL: Southeastern Kazakhstan, Ketmen Range: Podgornoye.
Distribution. Southeastern Kazakhstan (Falkovitsh 1964).

***Thiodia irinae* Budashkin, 1990**

Thiodia irinae Budashkin 1990: 417–418, figs 4, 5. TL: Crimea, Karadagh.
Distribution. Ukraine, South of European Russia (Sinev *et al.* 2019; Lepiforum 2022).

***Thiodia dahurica* (Falkovitsh, 1965) (Fig. 14)**

Foveifera dahurica Falkovitsh 1964: 435–436, figs 32, 33. TL: Russia, Primorskiy krai: Ussuriysk.
Distribution. Russia (Amur region, Khabarovskiy krai, Primorskiy krai) (Falkovitsh 1965; Sinev *et al.* 2019).

***Thiodia lerneana* (Treitschke, 1835)**

Grapholitha lerneana Treitschke 1835: 120. TL: Hungary.
Distribution. Spain, France, Italy, Austria, Hungary, Romania, Slovenia, Croatia, Bulgaria, Ukraine, South of

European Russia, Eastern Caucasus, Transcaucasia, Kazakhstan, Turkmenistan (Kuznetsov 1978; Razowski 1999, 2003; Sinev *et al.* 2019).

***Thiodia torridana* (Lederer, 1859)**

Tortrix torridana Lederer 1859: 250. TL: Europe.

= *Tortrix hastana* Hübner 1796–1799 (preoccupied name)

Distribution. Central and Southern Europe, South of European Russia, Southern Siberia, Transbaikalia, Amur region, Primorskiy krai, Transcaucasia, Turkey, Kazakhstan (Razowski 2003).

***Thiodia tscheliana* (Caradja, 1928)**

Semasia tscheliana Caradja 1928: 292. TL: China: Mountains west of Beijing.

Distribution. China. Record of this species from Romania (Obraztsov 1964: 151; Razowski 1996: 146, 1999: 44, 2003: 61) is based on incorrect interpretation of type locality of *S. tscheliana*. The species was described from single male collected in “Mountains west of Beijing” (Caradja 1928: 361, 388, 392), but not from Romania (see also Lepiforum 2022). Caradja (1928: 392) indicated affinity of *S. tscheliana* to *Th. anatoliana* and *Th. placidana*. Obraztsov (1964: 151) transferred *S. tscheliana* in “species incertae sedis” within *Thiodia* but gave no details supporting this decision. The systematic position of the species is uncertain until type remains unexamined.

***Epinotia glandulosana* (Walsingham, 1908), comb. nov.**

Thiodia glandulosana Walsingham 1908: 1004–1005, pl. LIII, fig. 2. TL: Canary Islands: Tenerife.

Distribution. Madeira, Canary Islands (Tenerife).

Note. The forewing pattern, male and female genitalia characters, and dendrophages larvae (Walsingham 1908: 1005; Kennel 1908–1921: 192; Klimesch 1987: 303, figs 26, 27, 28; Lepiforum 2022) suggest assignment of this species to *Epinotia* Hübner [1825], rather than *Thiodia*.

Discussion

For the first time the genus *Thiodia* has been diagnosed by Obraztsov (1964), who described the external morphology (including venation) and genital structures of six species recognised as members of the genus by that time. It should be noticed that two species currently placed in *Thiodia*—*T. hastana* and *T. trochillana*, have not been treated by Obraztsov, as he considered them as members of the other genera—*Foveifera* Obraztsov, 1946 and *Gypsonomoides* Obraztsov, 1946 correspondingly. Obraztsov did not specify clearly any characters that are unique for *Thiodia*, except for presence of shallow depression, fossa, filled with androconial scales at the base anal veins on male forewing (Obraztsov 1964, fig. 132). This structure, which represent some kind of a pheromone organ, looks as rounded bloating from dorsal side of the wing. Besides *Thiodia*, this character was observed in *Foveifera* and *Hendecaneura* Walsingham, 1900 but Obraztsov noticed that these two genera have nothing common with *Thiodia*, though the author placed a monotypic genus *Thiodiodes* Obraztsov, 1964 near to *Thiodia*. Subsequently *Foveifera* and *Gypsonomoides* were synonymised with *Thiodia*, some species were transferred to the genus and a number of new species were described (mainly from Central Asia and South Africa). As a result, the original concept of *Thiodia* has been considerably modified. Now *Thiodia* comprises the species which show rather big variation in wing pattern and genitalia of both sexes (see Introduction). Despite this variability, the absence of costal fold, the forewing with all veins separate, the absence of vein in the cell and M3 stalked with CuA1 in the hindwing are characteristic for *Thiodia* species (Aarvik 2004: 192). Pheromone organ at the base of male forewing, that was considered by Obraztsov (1964: 3) and other authors (Kuznetsov 2001: 401) as autapomorphy of the genus, has not been observed at least in one of *Thiodia* species, *Thiodia couleruana* (Duponchel, 1834). We suggest that further studies are necessary to realise if *T. couleruana* is the only species of *Thiodia* that lacks this autapomorphy, how reliable this character is, and how it correlates with other external and genitalic characters of *Thiodia*.

Most of the genitalic and external characters described for *Thiodia* are scattered within Eucosmini and do not define the genus if treated alone. However, the combination more or less reliably separates species of *Thiodia* from related genera of the tribe, among which *Eriopsela* Guenée, 1845 seems the closest. In contrary to males of

Eriopsela, males of *Thiodia* have usually more developed uncus, harpe on the valva in some cases and, as a rule, less jagged aedeagus. Females of *Thiodia* can be distinguished by stouter apophyses and usually well-developed emargination of posterior margin of sternum VII. Additionally, males of *Eriopsela* have no pheromone organ.

We do not exclude that future studies may result in revision of current concept of *Thiodia*. In this regards, the application of molecular studies seems promising, but currently only three species of the genus are represented by complementary public sequences in BOLD (<http://www.boldsystems.org>; Ratnasingham & Hebert 2007).

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